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JUNE 2008

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JUNE 2008 / Vol 28 - No 6

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06





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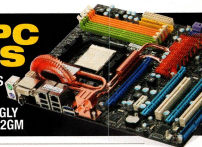
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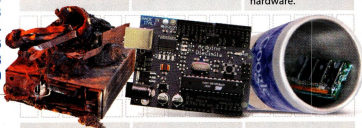
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## playable demo

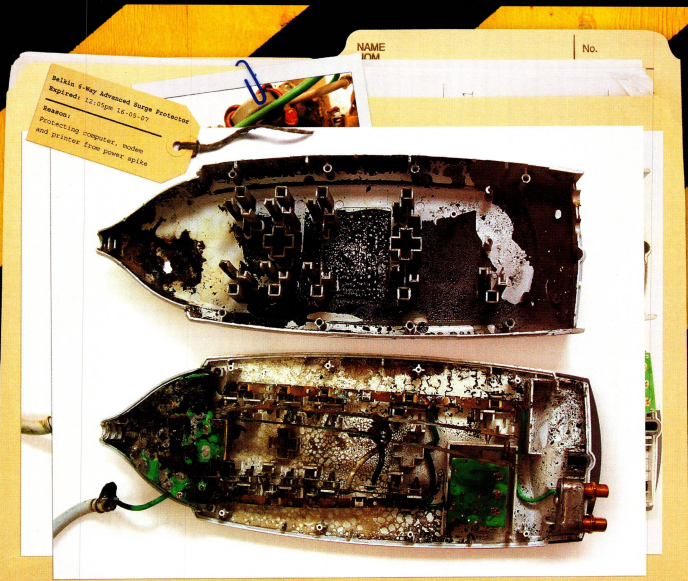


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# editorial



TONY SARNO

**E**very now and then something bubbles up from technology's grass roots that's unexpected and quite amazing. The Arduino technology (page 12) is one such product. It's a series of small circuit boards and components that come with open source control software — so basically you can create an electronic device to do virtually anything. Built by an Italian company, the boards have a micro-controller and components that can receive inputs from sensors or control electro-mechanical devices such as motors, servos, lighting or other hardware. They can form standalone interactive objects or devices connected to software running on a computer.

What's turned the reception for Arduino devices into something approaching a craze is that you don't need a degree in electronic science, programming languages and serious soldering skills to build one. The boards are easy to put together, and the open source control software is varied and simple to master. How easy? Even artists are using them to create electronic art installations with sensors that respond to their environment, or just to control the lighting effects at their shows. This is not to mention the thousands of hobbyists who are creating all kinds of useful and bizarre electronic devices.

This month, Jarrod Spiga's Masterclass on Building a Small Business Network (page 94)

comes to an end. From your responses this has been a very useful series for those IT folk we call 'Accidental Managers', who, due to their PC savvy, suddenly find themselves asked to run the IT in their small business but don't have formal IT training. Jarrod's entire Masterclass series will now be available online, on our new web site for tech professionals called APC Pro ([apcmagpro.com](http://apcmagpro.com)).

I don't normally spruik competitions in the editorial, but this month I have to make an exception. We're giving away 10, yes 10, of HP's new 2133 Mini-Note PCs. The \$899 machine is about the same size as an Eee PC but is superior in every way, from having a hard disk to a virtually full-size keyboard that's somehow been engineered into a sub-sub notebook. Details are on page 43 or on [apcmag.com](http://apcmag.com).

And, on another note, this month represents the end of an era: after many years of dutiful service, our faithful DVD Editor Lachlan Grant has left us for a working sabbatical to London, so this month's DVD is his last APC cover disc. We'd like to thank Lach for all the work he put in over the years and wish him a happy trip. In light of Lach's hasty departure, we've had to streamline the interface a tad this month. Things might look a little different, but all the important stuff is still there. We'll be back next month with our new DVD Editor, and we'll be presenting our new DVD interface then.



## NOT TO MENTION THE THOUSANDS OF HOBBYISTS CREATING ALL KINDS OF USEFUL & BIZARRE ELECTRONIC DEVICES

### JUNE AWARDS



We reserve the Editor's Choice award for the very best products available on the market.



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# TEACH YOUR OLD PHONE NEW TRICKS.

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*Your potential. Our passion.®*

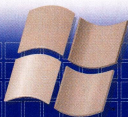
**Microsoft**





## Windows SP3

Is SP3 a healthy heartbeat for XP, or are we looking at an operating system flatlining...?



Microsoft  
**Windows<sup>xp</sup>**

# IS SP3 REALLY THE END FOR XP?

**With the final major service pack for Windows XP, Microsoft is hoping people will start focusing on Vista, but Dell, ASUS and others still see a large market for XP.**

**W**indows XP Service Pack 3 release manager Chris Keroack quietly announced on the TechNet forums recently (<http://tinyurl.com/4scrm3>) that SP3 for Windows XP had been released to manufacturing and was being distributed to PC builders and enterprise users.

Home users will have to wait a little longer. Microsoft began updating documentation relating to SP3 on its site from April 29, but the code itself won't be launched via Windows Update until "early summer", Keroack said (which we'll guess means June). Release dates for the embedded and stripped-down 'fundamentals' versions of XP haven't been announced yet.

Unlike XP's previous service pack, the infamous SP2, which added major new features to the OS and broke many a corporate desktop image in the process, SP3

doesn't introduce a lot of visible changes. The bulk of the code simply bundles together major patches and fixes added to XP since SP2 was released back in August 2004.

New features include support for Windows Server 2008's Network Access Protection feature, better black hole router detection and more descriptive text in some security dialog boxes. Surprisingly, the service pack doesn't include Internet Explorer 7, though XP users can download this separately.

The low-key and drawn-out nature of the announcement contrasts sharply with the energy put into promoting the availability of the first service pack for Vista, also released in April. It is widely assumed that SP3 will be the last major service pack for XP, with any future security patches rolled out individually rather than bundled up.

However, the fly in the ointment for that strategy is the difficulty Microsoft has experienced in convincing people that Vista is actually a better choice than XP. The company had originally planned to stop manufacturers releasing PCs with XP on them at the end of 2007, but was forced to extend the deadline to June 2008 when it became clear that many people found Vista too slow, too buggy and generally not worth the hassle.

SP1 is supposed to solve some of those problems, but despite fixing some issues (such as file transfer speeds) XP is remaining stubbornly persistent. Microsoft has already said that it will continue selling Windows XP Home for use on what it awkwardly calls ULCPCs (ultra-low-cost personal computers) until at least mid-2010, a move designed to stave off competition from leaner Linux-based systems such as the ASUS

Eee PC. (The Eee PC itself is also available with XP installed; see the story on [apcmag.com](http://apcmag.com) at <http://tinyurl.com/68vojo>.)

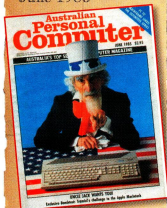
Some manufacturers also see a longer lifespan for XP in other markets. At the launch of its new Vostro small business notebooks recently, Dell small business marketing manager Jay Turner said that while Vista "was the main game" for Dell, there was still a significant demand for XP from small business customers, and that the new models would be available with XP installed.

While this technically requires purchasing a Vista Business licence and then 'downgrading' it to XP, machines would ship from the factory with XP installed and recovery media for both OSs, Turner said. He added that Dell expected those sales to continue beyond June.

*Angus Kidman*

## THE (A)PC REVOLUTION

June 1985



### UNIX MUST MAKE ITS MOVE

The MS-DOS environment is now the de facto standard operating system for small standalone micros. This still leaves some potential in the multi-user area. . . Can Unix move in here? If it's going to, then it has two years at most in which to achieve a worthwhile market share. In that time, the fragmentation of the market for Unix systems must be cleared up. For example, although AT&T now claims that Unix System V is the standard, there is still a lot of System III around. At the same time, Microsoft's Xenix is claiming the lion's share of the low-end Unix marketplace.

### ATARI 520ST

There can be no doubt that the Atari 520ST is a very impressive machine. It seems to have everything going for it — good keyboard, lots of I/O facilities, lots of RAM (512KB), and for many the nicest 16-bit processor around, the Motorola 68000 running at 8MHz. When you add the GEM friendly user interface and the availability of the cheap disk drives (10MB or 20MB) you end up with a very impressive system indeed.

\$899

## HP PREPS SEXY NEW 'EEE PC KILLER'

HP is set to trump ASUS with a sleek aluminium-chassis Eee PC-Killer with a bigger feature set for around the same price.

**H**as ASUS set off a new price war in the mobile computing landscape? It was only a few years ago that brand-name laptops started to slide in under the \$1,000 mark. Then the Taiwanese company released the Eee PC. Its super-compact size and weight, surprisingly decent feature set, customised Linux OS and \$499 price tag all ensured the Eee PC found favour well outside its intended target audience of school kids. Travellers and tech tinkers alike have adopted the Eee PC as a brilliant little 'second PC', and in some cases even a second laptop.

This has ignited interest in the mini-notebook form factor and proven that if you get the formula right you'll find buyers. Now HP is coming to the party, dressed to steal attention away from ASUS. There's no doubt that the Compaq 2133 is aimed at a more professional slice of the market.

The notebook itself looks more like Apple's classic 12in PowerBook G4, thanks to clean lines and an anodised aluminium chassis, although this plays some part in tipping the weight to 1.2kg. The 8.9in widescreen panel runs at a higher-than-Eee PC res of 1,280 x 768 (WXGA), and includes a tiny webcam above it. The keyboard is 92% of the full size of a normal

notebook keyboard and noticeably easier to type on than the squashed keyboards on most ultraportableables. It also boasts technology handed down from more conventional notebooks, such as Gigabit Ethernet and a 3D accelerometer to protect the hard drive from sudden knocks and shocks.

On the communications front, the 2133 has 802.11b/g wireless, an ExpressCard/54 slot (for both the skinny cards favoured by devices such as 3G HSDPA wireless modems and the fatter cards such as slot-in card readers) and two USB ports.

That's a pretty full set of features, however, one downside is the processor — a Via C7 ultra low power CPU running at either 1.2GHz or 1.6GHz. While that's adequate to run Linux at a good clip, performance for Vista is likely to be sluggish. HP may update to Intel Atom in a future product revision, but for now, it's not a deal breaker considering the outstanding form factor and other features of the 2133.

Like many other low-cost ultraportable PCs, HP is offering users the option of taking the excellent SUSE Linux Enterprise Desktop 10 rather than Vista. When we reviewed SLED for APC, we noted it had particularly good desktop search functionality, and was a very polished distribution.

Pricing in the US starts at \$499 (AU\$534) but this is for a model with only 512MB RAM, 4GB storage and a 1GHz CPU. Presumably HP felt this wouldn't sell well in Australia, so the lowest-priced model selling here costs \$899, which

includes a 1.2GHz processor, 120GB HDD and 1GB RAM. A slightly pricier version will sell for \$999 and includes a 1.6GHz processor, 160GB HDD and 2GB RAM.

HP says it plans to offer the ability for customers to downgrade the specs to save money in the future — but does not have this option available immediately.

David Flynn

SEE  
PAGE 43  
FOR DETAILS ON  
HOW YOU CAN  
WIN 1 OF 10  
HP 2133s



TransferJet's rate of adoption could be assisted with USB-connected adaptors.

# JUST ANOTHER WIRELESS NETWORK?

Ian Robson dissects Sony's latest connection method.

**W**ith Wi-Fi, Bluetooth and soon Ultra Wide Band and wireless USB polluting our airwaves, why does Sony think another wireless technology will prove a success? Well, unlike those mentioned above, TransferJet is not proposed as a disruptive transmission force: it uses electric induction to transmit data rather than radiation field antennas. This means it will not interfere with or be degraded by any surrounding radio signals — and this includes natural interference from materials.

Most personal area network applications do not need to be wireless over any significant distance. Think about what you use wired USB for now; it's mostly suited to transferring large data files from external storage devices, or perhaps synchronising your smartphone. The common thread

is that you are usually not too far away from the device you are transferring to. What users want is an untethered and seamless connection to a large number of consumer electronics devices, with no setup, no interrogating interface and no connection drop-out when you least expect it. An exclusive demo at Sony's Tokyo headquarters revealed the potential of TransferJet.

Once a close proximity connection is recognised, TransferJet's induction coils jump into life with almost instant device ID recognition. In each case, the receiving device connected in about a second and transferred around 40 hi-res JPEGs in a few more seconds to a connected display. A similarly seamless demonstration was given of a 1080p HD video playing on the screen. With TransferJet's real-

world transfer rate of around 375Mbit/s, there's even enough headroom for simultaneous applications should you require it.

With wireless technologies criticised for draining the power from diminutive devices, we asked Sony how much energy TransferJet required for operation. Unfortunately, Sony cited strategic reasons for not providing specific data. It was, however, prepared to state that it was confident the power used by TransferJet (per bit of data transferred) is a mere fraction of that used by other wireless technologies such as Wireless USB, 802.11a/g and Bluetooth 2.0.

Sony seems to have a front-running attitude to what's required for the public at large. And more importantly, it's demonstrating full working products already.

## TRANSFERJET ISN'T ALONE IN THE WIRELESS SPAWNING POOL. .

Both Wireless USB and Nokia's Near Field Communications are gearing up as major competitors to TransferJet. Meanwhile, Bluetooth is battling to up its speed and range to compete, and Wi-Fi is arguing its case as the blanket coverage device. Intel's Chief Executive Paul Otellini is right to say that users don't want to "care about

whether to use WiMax, Wi-Fi, cellular, or Bluetooth"; but with Intel pushing forward a new multi-radio transmitter for all these technologies on an Ultra Wide Band platform, all it's doing is supporting myriad standards.

The first TransferJet products are tipped for release as soon as June

2008; success will depend upon wide industry adoption. Whether the industry sees the inevitable licensing cost as an obstacle remains to be seen. However, even combined with the cost of a small transceiver unit, it could still run to less than \$10 overhead per device — comparable to Bluetooth at least.



## DISAPPEARING DVDs

**I**t's one of those dumb ideas that just refuse to die: the disposable DVD. German company DVD-D has just revived the idea, with a DVD that self-destructs within 48 hours of purchase. The company's 'Einmal' discs have a chemical coating that makes them unreadable within two days. As soon as the discs are removed from their vacuum-sealed package and exposed to oxygen in the air, the chemical starts to rot them and they return a disk error message after 48 hours. The discs don't come with copy protection, but the idea is that if they are sold very cheaply (around \$10) people won't bother copying them. This concept has been tried before by US-based companies: in 1999, by Circuit City with its 'DIVX' self-destructing DVDs; and in 2004 by the Convex Group, with its 'FlexPlay' DVDs that were trialed by Disney as rentals that you didn't have to return. Both were failures: they were still expensive and were attacked by environmentalists who said they'd lead to unnecessary landfills.



## Want to nominate a dumbest moment in tech?

Send an email with the subject line "Dumbest Moments" to [service@apcmagazines.net](mailto:service@apcmagazines.net). All correspondence becomes the property of APC.



# INTEL PUSHES THE BOUNDARIES OF YOUR POCKET

Intel's big developer event in China in April was squarely focused on the tiny-PC space — but they're not tiny enough, yet, reports APC's Dan Warne.

**T**he key focus at the latest Intel Developer Forum was Atom: Intel announced full details (speeds of up to 1.6GHz and Atom+ chipset power consumption of around 3W) and showed a bunch of 'mobile internet devices' (MIDs) from numerous manufacturers. They all had one thing in common — they were still too big and heavy to fit easily in your pocket, and this was underscored by the fact that every Intel exec that held a roundtable press briefing laid their BlackBerry on the table in front of them.

When asked whether this generation of MIDs would take off, mobility chief, Dadi Perlmutter, said he thought they had "some chance". When pressed to say whether they would sell well, Perlmutter was entirely non-committal, saying making MIDs was an evolution and that the next generation would have "a way better chance".

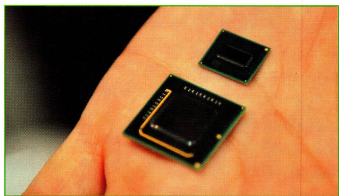
Intel does have some evidence to show it is getting much closer to an Atom-based pocket device though: an astonishingly small double-sided PC motherboard no bigger than a drink coaster or credit card, which will have all the components you'd expect in a small form factor PC — including Wi-Fi, 3G and/or WiMax.

However, the dud MIDs were not the sum total of what Intel showed off at IDF. It had some spunky prototype car entertainment systems running with an Atom CPU, suggesting that x86 architecture is coming to your car stereo sooner

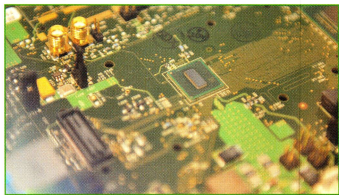
rather than later. It also showed some incredibly low-cost desktop PCs and notebooks based around Atom with lower-than-Eee PC pricing. It calls these 'nettops' or 'netbooks' because they are really designed for browsing the net and basic office app tasks, rather than anything more strenuous like gaming, editing video or ripping DVDs. But when you consider a 1.6GHz Atom CPU is fanless (and can even be run without a heatsink) it translates to easier system builds and nicer form factors.

Intel also talked in detail about its upcoming 2009 Nehalem processor architecture, which will replace the current Penryn generation of Core 2 Duo CPUs. Nehalem will be produced in configurations up to eight cores on a single die — and Intel demoed a prototype chip running at 3.2GHz. A key improvement is a data-transfer rate to memory that is four times faster than current-generation Xeons running with a 1,600MHz frontside bus.

It also announced it will be manufacturing Intel-branded flash-based SSD drives in capacities up to 160GB in both 2.5 and 1.8in form factors — encouraging news for owners of ultraportable PCs that currently have limited hard drive capacities due to their use of 1.8in drives. Intel's Knut Grimsrud says hard drives have become a significant bottleneck with high-performance processors and showed PC demos with an SSD-based machine finishing a video



Low power — Intel's tiny Atom CPU and its controller chip — together they suck less than 3W of power.



Fanless — Intel's Atom CPU shown running in a car entertainment system with no cooling whatsoever. (Ah, it takes us back...)

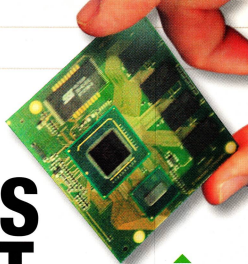
encoding process before the hard-drive based one had even begun.

The chip giant didn't have much to reveal about Larabee — its multicore 'stream processor'.

Intel was also frank about the challenges it faces with convincing the world that its long-delayed WiMax technology (set to ship with the Montevina PC platform later this year) is a preferable technology to the HSPA mobile networks that are popping up all over the world as

operators upgrade their 2G and 3G networks. "It is up to us to prove the viability and, until it is done, there is going to be scepticism," said Dadi Perlmutter, who also offered the reassuring promise that Intel would be involved in helping network operators construct WiMax networks "this year, and if not this year, next year."

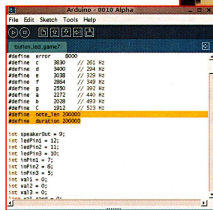
Dan Warne travelled to IDF China as a guest of Intel.



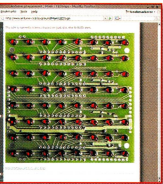
This double-sided drink-coaster-sized motherboard has most of the stuff your top-flight ASUS mobo has.



The development environment runs on Windows, Linux and OS X—it's an editor that highlights code before sending it to Arduino.



The Arduino playground is full of tutorials and reference information, making it easy to find code and examples that work with your hardware.



# CIRCUIT-BENDING WITH ARDUINO

Open source development hits hardware hacking in a ground-breaking way. *Graham Morrison and staff writers show you how.*

**U**nlike software development, hardware design and electrical engineering has always required serious ambition. This is because the tools and training required to attain the necessary skills have always been expensive and out of reach, until now.

Circuit-bending cheap electrical equipment has become something of a niche hobby for some, rewiring and reprogramming everything from the Nintendo Game Boy to the ancient Speak & Spell toy. But 2006 saw the release of something entirely different: a development platform for hardware hackers called Arduino.

What made it so special was that the design, along with all the software used to drive it, was released using an open-source licence. The hardware schematics were released under the Creative

Commons licence (share-alike 2.5), and several small-time circuit builders now offer their own compatible boards built to the same specification.

The software too is open source, from the library of functions that accompany the unit to the Java development environment used to write code for the hardware. They're all released using the GPL and LGPL licences used by much of the Linux operating system, and the impact of the set has been significant.

Feeding the imaginations of hungry hardware hackers everywhere, it has single-handedly created a boom in homemade electronics, turning the Arduino community into a melting pot of crazy ideas, hacked hardware and performance art. Now that cost is no longer an issue, Arduino has had a similar impact on hardware

development as the release of the GPL has had on free software.

Marcus Schappi, the owner of Little Bird Electronics, is the distributor of Arduino in Australia. He says the appeal of Arduino is its comparative low price and ease of programming, which allows the rapid prototyping of ideas.

"Many university faculties are using Arduino in their courses, from bio sciences measuring human kinetics to art departments creating interactive sculptures. The most interesting project I have seen based on Arduino is a system that will allow your plants to SMS you when they want to be watered," Schappi says.

"It is a very exciting time, almost like a second renaissance, where the common man with a little knowledge of web programming, basic electronics and some initiative can create

really cool interactive objects. It's not Rocket Surgery; anyone with basic programming skills can learn how to create some fun and interesting projects."

## ANYONE CAN PLAY

The best thing about Arduino is that it isn't complicated. You don't need any electronics experience, or even any programming experience, to be able to use it. The hardware is really just a simple controller attached to a piece of silicon, along with various pins that can be programmed for either input or output; that's all there is to it.

A USB connection attaches Arduino to your computer, and the Java-driven software is used to program the controller from your desktop. When you remove the power from Arduino, provided either by the USB connection or

# THE HARDWARE

There have been several iterations of Arduino, starting with the Serial Arduino that featured a serial port connection. Modern versions usually include USB, although the Arduino BT can use Bluetooth instead, and is obviously useful for remote configuration. All the boards can be powered from a variety of sources, including the USB and an external power connector, and the most recent is called the Arduino Diecimila.

## USB PORT

Programs are sent to Arduino through the USB connector. When loaded they survive power loss and a reset.

## POWER JUMPER

This is used to select which power source to use. USB is great when you're developing, but you can also use the 9V connector.

## POWER INPUT

Use a 9V power adaptor, or attach a 9V battery to the pins to provide autonomous power to the board — no computer required!

## ATMEGA168

This is the microcontroller that holds your programs, as well as managing the various input and output ports on the board.

## ANALOGUE CONNECTORS

Great for piezo buzzers, light sensors and potentiometers, the analogue connectors detect changes in voltage and report them to the microcontroller.

## RESET

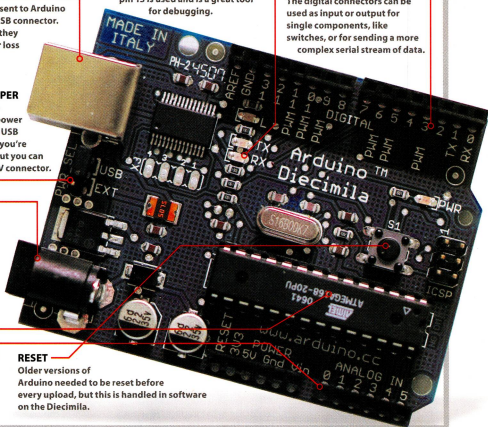
Older versions of Arduino needed to be reset before every upload, but this is handled in software on the Diecimila.

## STATUS LEDs

The TX and RX LEDs here light up when data is transmitted and received. The L LED lights up when pin 13 is used and is a great tool for debugging.

## DIGITAL CONNECTORS

The digital connectors can be used as input or output for single components, like switches, or for sending a more complex serial stream of data.



a 9V battery, Arduino even keeps the program logic. This means that you only need to introduce power again, either through the 2.1mm barrel power jack or the USB connector, for your project to spring back to life. Perfect for a standalone solution inside a box.

To do anything useful with Arduino, you're also going to need a selection of components to plug into the board. Arduino starter kits will typically include an assortment of LEDs, switches, potentiometers, light sensors and a piezo buzzer, along with the wires and resistors to connect them. None of this stuff is expensive, and you can buy a genuine Arduino with enough components to get started for around \$50.

But the main point with Arduino is that you can attach any standard components to the board, and that's exactly what

many people are doing. The Arduino wiki, an online resource that's known as the 'playground' to its users, is a repository for many of the crazy ideas and experiments Arduino users have been creating.

## COMMUNITY DRIVEN

It's from here you can see what other people have done with their boards, often accompanied by detailed wiring diagrams and even videos. The source code is always available, so that you can download and bend other people's projects to your requirements.

That's what Arduino users have been doing. If you can think of it, there's a chance another user did 12 months ago, built the project, and posted it to the Arduino wiki. You'll find lots of robots powered by servos, small synthesizers and digital audio converters, piezo-powered MIDI-generating drum

machines, intelligent furniture and a circuit-bent coffee machine 'for that perfect cup of coffee.'

After you understand a little about its capabilities, you find yourself having ideas of your own. There are a lot of projects that deal with light and sound, for example. This is because light sensors are cheap and easy to use, and sound can be generated in a variety of ways — from attaching a simple speaker, to constructing a more complex sound using the PWM outputs on the board.

But the vast majority of Arduino projects don't feature artistic expression. They're merely the ideas of a lone developer doing something cool. It might be something simple like a light meter, or a volume control knob, or a massive array of shimmering LEDs. Each of these can be built and implemented in

software in about 30 minutes.

Just wire up the components, write the code and send the compiled project down the USB cable to your Arduino. Even the programming is straightforward. The IDE where you type your code is as simple as you can get. A text window with syntax highlighting surrounded by a few buttons. The language itself is like a simplified version of C. You can go a long way typing a few lines and using a couple of 'if' or 'while' statements, and the source code for most projects is easy to understand without being any kind of expert in the C language. This is really where Arduino shines. The platform is inexpensive enough that you don't worry too much about damaging components, and this makes it the perfect platform for experimentation. And that's what us geeks like doing best. **STIC**





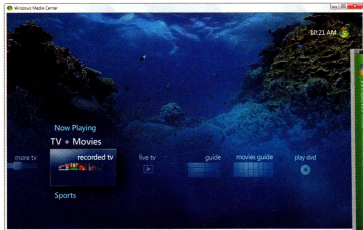
# A better ultimate

Does Vista Ultimate represent the 'ultimate' in unnecessary features?

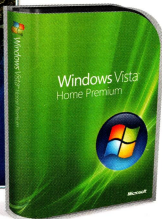
One of the many features that makes Windows Vista stand out from previous Windows builds is the bewildering number of flavours it comes in. Home Basic to Ultimate and everything in between. Although I run Vista Ultimate at home, a planned system upgrade forced me to reconsider whether I really wanted or even needed it. After all, Ultimate contains every Vista feature, including many I just don't need and never make use of.

One of the criticisms levelled at popular Linux distributions is that they are 'bloatware' — they come with so many inbuilt applications that you spend most of your time trying to decide what you don't want rather than what you do, and you invariably end up with the operating system taking up far more space and resources than you really need it to. With all the extra features Vista incorporates as you travel up the version hierarchy, it's beginning to feel like a similar situation, and there's no denying that Vista Ultimate at the top is much fatter than its streamlined brothers.

Looking at all the versions available, I realised that the best choice to meet all my needs for gaming, browsing, media playback and office productivity was the humblest version available — Vista Home Basic. Surprised? Don't be. Home Basic is still Windows Vista, so



Features, features, features: but which do you really need?



ESSENTIALLY, I'M TRYING TO SUGGEST THAT ULTIMATE IS PROBABLY THE LAST OS ANYONE IS LIKELY TO NEED

anything that you can install on any of the other versions you can install on Home Basic. The most notable difference with Home Basic is the lack of the Aero interface. To some people, that's good, but if like me you quite like Vista's new look, you can enable it in Home Basic with a few simple registry changes.

Home Basic also doesn't come with Media Center. For some people, that's certainly an issue, but is it really a problem for a computer that you're physically sat in front of? Media Center is designed to be used in a home theatre environment, where a full screen application GUI is actually beneficial rather than restrictive. If I want to play media, Home Basic has Media Player along with any of the many free and

excellent media players out there, like Winamp (still the best!).

If Windows is a must for you, then Vista Home Premium is the OS of choice. ... don't let some salesperson who was working in the haberdashery department only last week con you into Vista Ultimate just because you want to play a DVD or two. Although, to play devil's advocate, there are open source media centre applications like MediaPortal which run quite happily on Home Basic and will give you an excellent (some might even say, better) home theatre experience...

The area where Home Basic does fall down is in business. It's not designed with laptops in mind, won't connect to an Active Directory domain and doesn't have any

backup or encryption functionality. If these features are important to you, get Vista Business: it will meet all those needs and still provides every feature that Home Basic does.

Essentially, I'm trying to suggest that Ultimate is probably the last OS anyone is likely to need. While it's impressive to have a system which can join a domain, stream media to an Xbox 360 and encrypt all its drives, you'd be paying through the nose to acquire that sort of functionality. Ignore the marketing hype and think about what you really, really need. But having said all that, with rumours of at least a 10% performance improvement over Windows Vista, I'm considering building a gaming system using Windows Server 2008! [BLOG](#)



## HastalaVista

by

James Bannan

James Bannan is a systems manager at St Leonard's College (Vic) and APC's resident Windows expert. He'll be checking out Vista for you every month.

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# Distro diversity

The natural evolution of smaller distros into larger ones is all well and good (and helps the Linux cause). But it doesn't mean you should ignore the new generation.



One of the brilliant aspects of Linux is the diverse range of distributions that are available. And one of the worst aspects of Linux is the diverse range of distributions available. From a standardisation standpoint — which is a somewhat critical facet for mainstream acceptance — having hundreds of distributions doesn't make it easy for business or home users to understand what 'Linux' represents. Even a handful of commercially supported and popular distributions is a handful too many if Linux is to become as household a name for Everyday Joe just like Windows.

Which is why, in the natural order of things, the field of options has naturally narrowed over time as some distributions gain traction while others fall by the wayside. Redhat, SuSE, and Ubuntu are all prime examples of distributions that dominate the desktop and the mindscape of users when you say 'Linux', and it's a very good thing

indeed — when commercial entities approach Linux and finally decide to support it — drivers for example, and most certainly applications — they can focus on and produce just one or two binaries instead of worrying about supporting dozens or more (because they won't be bothered if they have to).

Interestingly, and unsurprisingly, there are many distributions that base themselves off and build upon these larger ones for three key reasons: because they can thanks to the nature of open-source; because they've already done a great deal of

distributions that are small today but that, like Ubuntu, could grow rapidly if only more people knew about them?

Well, I can change that in my own little way by pointing you to them, and ask that you check them out. They may not be what you want, they may not do what you need, but you'll never know unless you try — and it's keeping the diversity active that drives innovation, regardless of where you look for it in society.

So while we do love our mainstream distributions like Redhat, SuSE, Mandriva, Gentoo, PCLinuxOS, Ubuntu and others,

Enlightenment; Frugalware ([frugalware.org](http://frugalware.org)), for those not afraid of a little command line action; Fluxbuntu ([fluxbuntu.org](http://fluxbuntu.org)), lightweight combination of Ubuntu and Fluxbox; Scientific Linux ([www.scientificlinux.org](http://www.scientificlinux.org)), built by and for universities around the world; GoboLinux ([www.gobolinux.org](http://www.gobolinux.org)), re-defines the Linux filestructure similar to Windows; Wolvix ([www.wolvix.org](http://www.wolvix.org)), multimedia distribution built around the popular Slackware; Granular ([www.granularlinux.com](http://www.granularlinux.com)), built for new users to Linux; KateOS ([kateos.org](http://kateos.org)), clean and



## THE BIG GUNS OF THE LINUX DISTRIBUTION WORLD WERE ALL SMALL ONCE — THEY ALL STARTED SOMEWHERE

the groundwork and there's no sense letting that go to waste; and because they can maintain compatibility of their new distribution with a mainstream one and in turn allow a wider acceptance and use. After all, even Ubuntu is based on Debian.

But the big guns of the Linux distribution world were all small once — they all started somewhere. So what of the distributions that mainstream forgot? What of the

consider these smaller and lesser-known ones also: Kanotix ([kanotix.com](http://kanotix.com)), a Knoppix-based distribution; Vector Linux ([vectorlinux.com](http://vectorlinux.com)), built with the motto 'keep it simple, keep it small'; MEPIS ([www.mepis.org](http://www.mepis.org)), a distribution that 'just works'; Zenwalk ([www.zenwalk.org](http://www.zenwalk.org)), fast and user-friendly; Arch ([www.archlinux.org](http://www.archlinux.org)), lightweight and optimised for i686/x86-64; OpenGEU ([opengeu.intilinux.com](http://opengeu.intilinux.com)), a merging of Ubuntu and

simple distribution for intermediate users; Lunar ([www.lunar-linux.org](http://www.lunar-linux.org)), a source-based distro similar to Gentoo; Ark ([www.arklinux.org](http://www.arklinux.org)), aims for new and experienced users alike; and Puppy ([www.puppylinux.com](http://www.puppylinux.com)), a new user-friendly and Australian-developed distribution.

This is just a snapshot of some of the other, lesser-known (but equally deserving of your time) options out there. So set aside some disk space, and give one of them a go! [tiny.cc](http://tiny.cc)

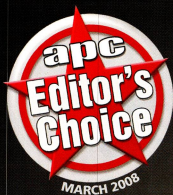


## LinuxWindow

by  
Ashton Mills

Editor of the Linux Pocketbooks series, and now with CHOICE magazine, Ashton has been a tech journal for over 12 years, including five years with APC.





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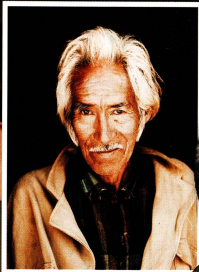
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# Experience necessary?

Who needs an IT manager when you have a head-kicker instead?  
(And crazy grandmothers.)

**R**eaders Graham Burge was working for a company that had just terminated its IT manager in order to save money. "They replaced him with a senior manager from another field who had no formal training in anything, and no basic training in IT," says Burge. "He was a total prat who really had no idea of what IT was about. He was originally hired as a head-kicker. Anyway his mandate was to streamline IT and get everyone working effectively and efficiently."

Burge says one of the new senior manager's first tasks was to streamline the company's email protocol. "This bloke spent two months writing a manual on email protocol and etiquette. This manual was about 80 pages long and a copy was sent to each and every user. This was a hard copy and there were around 300 users. The cost was tens of thousands of dollars. Everyone was amazed we did not receive an email directing us to a site to read it from. In the protocol it talked about effective and efficient communication. He couldn't see the irony of his stupidity. What a dahl!"

## HELPING THE BOSS'S WIFE

As a long-time hobbyist, Tony Brooks has become the 'PC Guy' in

the small business for which he works. A couple of years back, when PCs still arrived with an in-built 3.5in floppy drive, he fielded this one from the managing director's wife, who was calling from home:

**MDW:** "Hi Tony. Fred suggested I should call you, we are having a problem with our new computer. A friend has given me all her favourite recipes and she put it all on a disc for me. My problem is that I can't get the disc into the machine."

**TB:** "I'm sorry, I don't understand. Why can't you?" (Thinking: "OMG, surely they haven't given her a 5.25!")

**MDW:** "Well, I push the little button that the salesman showed us, and the little tray slides out ok. But it looks to me like a tiny record player that should take something round. This thing I've been given is square, and it's too thick. The tray won't close again."

Brooks says the problem was then easily solved. As she was the boss's wife, he was careful not to make fun of her stupidity.

## GRANDMOTHERS

We love grandmothers that don't let a lack of PC knowledge stand in their way. Reader Kah-Hoe Kwa recalls being woken up by his grandmother one morning.

"She wanted to fax a piece of music to a friend. I told her that since we didn't

have a fax machine I would have to scan it in and use the modem. So, I go downstairs to turn on the computer. While it was booting, I decided to go brush my teeth, make the bed, etc.

"When I get back, I discover that my grandma has folded up the piece of paper, and is trying to push it in between my two optical drives, telling me that she's 'faxing'!"

Kah-Hoe says his granny also doesn't let frozen programs interfere with her computing. "She thinks that if a program freezes, she should start it up again. Whenever she calls me complaining that the computer's not working properly anymore — I arrive to see 32 instances of the same program running."

## BAD BOY TECHIES

At APC we believe there's no harm in playing the occasional prank on dumb end users if it helps educate them. Neither did reader Conrad

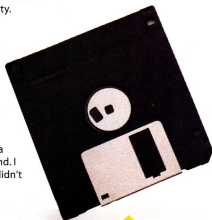
Chan and his mate who had just bought a fancy new wireless mouse.

Chan told his friend to plug the mouse receiving station into the USB port of the laptop belonging to another worker. "Then I told him to move it around."

When the victim saw the mouse cursor suddenly moving, he was so surprised that he jumped right out of his seat. "While we were both trying to hide our giggling, he was trying to fix the problem," says Chan.

"Firstly, he restarted his laptop. Once he saw no change he ran his anti-virus. When this didn't fix the problem, he started getting frustrated. He tried all sorts of things: system restore, disk check, to no avail. He uninstalled several programs, and still no change.

"Someone told him he should reinstall his mouse driver or get a new one. Then he was starting to think it was his touchpad, and was



Oh, yeah. We can see how you could get these two confused... not!



EndUser

from

The readers of APC

APC readers who deal with new computer users or incompetent IT administrators share their survival stories.

~~Typewriter~~  
Keyboard

~~TV Screen~~  
Monitor

```
Microsoft(R) Windows DOS  
(C)Copyright Microsoft Corp 1990-2001.
```

```
C:\>mem
```

```
655360 bytes total conventional memory  
655360 bytes available to MS-DOS  
510352 largest executable program size  
  
4194304 bytes total EMS memory  
4194304 bytes free EMS memory  
  
19922944 bytes total contiguous extended memory  
0 bytes available contiguous extended memory  
15580160 bytes available XMS memory  
MS-DOS resident in High Memory Area
```

```
C:\>
```

Ah... DOS sweet DOS. And, hey, if you're running out of room, why not try deleting a few 'useless' files?

Incommunicado: when your "typewriter" won't talk to your "TV".

considering sending his laptop away for repairs. After around an hour of watching him going spare, I told him to check his USB port. He immediately saw the receiver and burst out laughing.

"I am incredibly surprised how some people completely ignore the pop-up balloon which appears when you connect a device stating 'Windows has detected new hardware'.

"Maybe because they think it's more annoying messages about Microsoft updates etc. To top this all off, he is considered the 'Computer Nerd' among us!"

Conrad, we're surprised the user laughed when he saw the receiver. Anyone else might have decked you.

#### ROUTERLESS VOIP

Ben Cooper from Yeringa Queensland received a support call from a user having trouble connecting his laptop to his wireless broadband router. "After I

got him to change some settings I told him that we needed to apply the settings and it would restart his router. He acknowledged and clicked apply. Just then I heard him ask: 'Now this won't affect my VoIP ph...' and the line went dead. The answer would be yes."

#### PC TYPEWRITER

Back in the 1980s, reader Mat Ward had a job providing telephone support to home IBM PC users. He recalls receiving a phone call from a user who said he couldn't get his "typewriter" to talk to his "television".

Instead of just telling the user he didn't support typewriters, Ward tried to figure out what the user was trying to do.

He says: "After a long conversation I worked out that 'typewriter' meant keyboard, and 'television' was a monitor."

As it turned out this user wasn't actually dumb, says Ward. "He'd

never used a computer before and didn't know the correct terminology. When I took the time to explain things to him he was a very fast learner, fortunately for my sanity!"

Yes, the 1980s was the era when people first came to grips with PCs and virtually everyone was a dumb end user at one stage. Ward blames IBM's design department for half his support calls.

"What about a tale of dumb design? The PS/2 mouse and keyboard ports were identical. At least half of the calls I used to get in the '80s were from users who had plugged their keyboards into the mouse port and vice versa."

#### TALES FROM THE DOS ERA

Recalling the days of the DOS prompt fill those who worked in tech support with horror. David Johnson, of Moonah, Tasmania, remembers one user who fancied his skills with DOS's command line

interface. The user rang him to complain that: "I was running out of space on my PC, so I deleted a few useless files, and now it won't boot!"

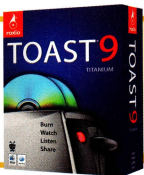
When Johnson inquired further, "I found this user had gone to the Command Prompt, performed a few 'dir' commands and found that his folders (including the Windows folder) contained 'useless files' called '.' and '..', so he deleted them!"

"I explained that '.' was actually shorthand for the current folder, and '..' was shorthand for its parent, so he had actually deleted all the files in the folders he visited and their parent folders. And no, he couldn't get them back from the recycle bin, so a complete reinstall of Windows and his applications was the only solution.

"The thing that really sets this user apart though, was that he did exactly the same thing again about six months later." [bit.ly](http://bit.ly)

## WINNERS!

The launch of Roxio Toast 9 Titanium redefines Mac burning. Toast 9 allows consumers to record high-def content from high-def camcorders and Blu-ray discs, as well as their favourite HD programming from Elgato's EyeTV devices. Users also have the option to burn HD video and slide shows on standard DVDs. For on-the-go entertainment, Toast 9 introduces Roxio Streamer, which allows users to stream video content stored on their Mac to a Wi-Fi connected iPhone or iPod Touch or any internet connected Mac or PC. Toast 9 also offers the ability to capture streaming audio for recording internet radio, and allows captured music tracks to be automatically tagged with song titles, artist or other related information. RRP \$179.95 inc GST.



#### SEND US YOUR CONTRIBUTION AND WIN A PRIZE!

Send in your tales of woe involving dumb end users or incompetent techies to [apcenduser@apcmagazines.com.au](mailto:apcenduser@apcmagazines.com.au) and if we print it, you'll win a prize. We must supply contact details in order for us to verify your contribution.

# Fire hazard?

Overclocking can be a dangerous business, and it doesn't look too good on your warranty claim either. But heck: isn't that what these boards are for? Watchdog investigates.

**T**his is something that I feel fellow PC enthusiasts should be made aware of. I built an HTPC using a Gigabyte GA35-D53(R) motherboard, Intel E6850, 2GB OCZ GOLD DDRII 667 and a Cooler Master 550W PSU. It was housed in a Thermaltake BACH Media case and also included a Noctua NH-U12F and NC-U6 Northbridge cooler. The CPU cooler was fitted with a Noctua S12 fan. I also installed two more of the Noctua S12s as extraction fans in the rear of my timber media cabinet. Suffice to say, this system ran very cool.

Over the Christmas period I had not used the system for roughly six days and it had gone into sleep mode. On moving the mouse, the system fired up (pardon the pun) accompanied by an acrid electrical fire smell. I quickly turned it off at the wall socket and removed it from the media unit and opened up the case. Turning it on again I was confronted by smoke and literally flames from the MOSFETs above the CPU socket. Naturally enough I turned it off at the wall again and extinguished the flames. This could have been a potential disaster if the unit had been set to wake up to record and no-one was home — or even deadlier if we were asleep.

I dismantled the PC and took the board to Gigabyte in Clayton. My contact there immediately said that this "was not possible with a Gigabyte board". He then took the board out the back and returned claiming that this was due to the board being overclocked. Yes, the board had been running at 3.6GHz very stably for two months or so using the "...default optimised"... voltages set by the BIOS when increasing the FSB. As all components were virtually stone cold when it started up, there must have been an internal short in

one of the MOSFETs or associated components.

If Gigabyte makes a product that fails like this (and then not accepts responsibility or to be held accountable) there may well be more extreme disasters in the future.

**Russell Binnion  
Carnegie, Vic**

*Watchdog contacted Gigabyte's William Kao, Field Application Engineering Manager and Specialist in Motherboard and Graphic Cards, who commented that Russell's motherboard when brought in was "way beyond repairable condition", displaying burn damage consistent with overclocking, and as such: "Warranty claim was rejected due to the act of using [the board] under non-standard specs or improper usage." In light of this policy, APC approached Gigabyte corporate about the matter, pointing out that the company does in fact market its products towards overclockers and emphasises the overclocking angle in their marketing — so what's the go with such usage not being covered under a Gigabyte warranty?*

## **Dear Watchdog,**

We do promote our motherboards as good overclocking platforms because many enthusiasts enjoy tweaking their Gigabyte motherboards; in fact, two Team AU overclockers recently each broke 3DMark world records with overclocked GA-X48T-DQ6 boards from Gigabyte. In the past we tried to prevent overclocking on our products because of the

massive stresses that it places on the motherboard (particularly the power circuitry), but for the past two years we have taken a different approach and rather tried to make our products more hardy and able to withstand the stresses of overclocking. This basically involved using the best-quality MOSFETs, chokes and Japanese solid capacitors (that make up the power circuitry) so that our motherboards would stay cool under stressful conditions. However, even the best-quality components tend to develop issues during overclocking — on any brand of motherboard.

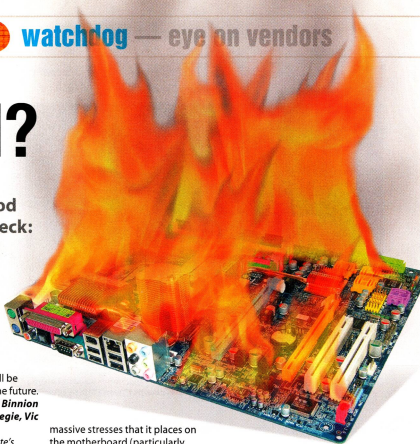
Gigabyte has a three-year warranty on all our motherboards and VGA cards if they are used with their standard settings because that is pretty much a controlled environment. It's when the controlled environment is no longer controlled that the warranty falls away. Essentially, we over-spec our motherboards so that they can be overclocked to a degree, but it is impossible to control the extent of the overclock for each overclocker, because some guys are just weekend overclockers who use a big cooler or even a water cooler, while others may be really serious

and use LN2 or DICE (dry ice). Serious overclockers who compete for benchmark world records will basically push their hardware until it fails! So it is impossible to guarantee that motherboards and VGA cards will never fail while being overclocked because overclocking by nature stresses the motherboard beyond its tried and tested settings.

This scenario can be likened to where cars are sold as sporty, fast, high-performance vehicles. Their speedometers show up to 220km/h or more. However, in reality the speed limit is only 110km/h, so very few cars travel at their maximum speeds — and even if they did they probably would not last as long as if they were driven within the speed limit.

In short, we design our motherboards to be able to handle a degree of overclocking, but when users tweak a motherboard there is no way for us to control the operating environment in order to guarantee its continued operation.

**Lili Wu  
Marketing Specialist  
Gigabyte**



**THIS COULD HAVE BEEN A POTENTIAL DISASTER IF NO-ONE WAS HOME, OR EVEN DEADLY IF WE WERE ASLEEP**



## THE MOTHER OF ALL SUPPORT ISSUES

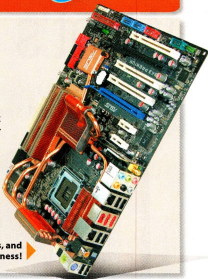
Donald Clark of Hornsby, NSW, wrote in to Watchdog to tell us of his "nightmare [of] a warranty claim for an ASUS motherboard". After returning home from a four-week vacation, Donald plugged his PC back into its power point, only to discover it wouldn't switch on. After checking all the components one by one and determining the motherboard was the problem, Donald tried to get in touch with his local reseller, only to find they were no longer trading. ASUS's web site suggests in this circumstance that one should contact the company directly by email, so Donald did, but alas: "Tumbleweeds and churchbells on that address." Eventual human contact proved no more helpful: US support

referred Donald to the out-of-business reseller, while ASUS China/Taiwan advised him to update the BIOS, "clearly not reading the history of the case." After six weeks of treading water, Donald finally found land: "Out of the blue I got a call from ASUS Australia explaining that I may have misunderstood their support structure. Apparently, if your reseller has ceased trading, you should contact any ASUS reseller who, for a fee, will contact ASUS and fix your component." ASUS Component Product Manager Shawn Yen was sympathetic to Donald's frustration and told APC: "We contacted the customer to offer special support due to the circumstances, however, as the motherboard was

already sent to Umart, it was already under warranty procedures and there wasn't anything extra we could do.

"We discussed the issue internally and have identified that in the future we need to ensure that customers understand the component warranty procedure, which is to take the product back to the resellers, and if the reseller is no longer operating, then we must ensure assistance to find the right contact window – either another reseller or the distributor. This warranty procedure is industry-standard, with other vendors having the same procedure."

**Reseller out of business, and support like nobody's business!**



## IRREPLACEABLE

I have an HP Colour LaserJet 3000dn printer. I have owned the printer for a couple of years and it has only had moderate use printing office documents and promotional literature. Recently it developed a fault — HP support very kindly gave me the user-replaceable spare part details and told me how to order the part online. However,

this is when what seemed to be a simple fix became what could be a very costly repair. The full price for the replacement board (part #Q5982-67908) is \$1,389.30, which is not much less than the current selling price of a new HP Colour LaserJet 3000dn! When I contacted HP support to explain the problem, even they agreed the spare part

price was far too high compared to the cost of a new printer. This reflects that HP and other printer manufacturers sell their units at below cost and then balance the books with the sell price of the consumables. I can understand this for entry-level printers, but the 3000dn is considered by HP to be a professional product and should have a better support program.

**Harvey Gordon  
Manly Photoworld  
Manly, NSW**

Watchdog referred Donald's criticisms to HP and asked the company to explain the policy behind their replacement part pricing.

### Dear Watchdog,

In response, we understand the frustration that must be felt by the consumer regarding the cost of the replacement board for their HP printer. The price of the spare parts is determined by a number of immutable costs including development, packaging, storage, transportation and servicing; additionally, all replacement/service spare parts are in fact sourced at the time of the product

launch and result in a fixed price.

**Jacqueline Ibrahim  
Hewlett-Packard South Pacific  
Marketing Communications  
Manager  
Imaging & Printing Group**

Donald wasn't exactly satisfied by HP's comeback: "I find the response from HP strange. It seems that they are totally aware of these types of issues with spare parts, and they acknowledge that consumers don't find their pricing policy satisfactory, however it seems that they are not willing to help in any way. If their spare part prices are 'immutable', then how come their new product prices are very 'immutable'. I will not pay 90% of the printer replacement price for a spare part. As printer models get to EOL it would make consumers happier if they could keep them going with spare parts reduced in price in accordance with the deep discounting EOL pricing that HP and others use, rather than being made to buy repair parts selling for their original price. My HP Colour LaserJet has now ended its very short life. As for a replacement... it will be one with a very long extended warranty or one that is cheap enough to replace every two years." **B14C**

**HP's replacement part prices can really hit you in the HP (hip) pocket.**



[watchdog@acpmagazines.com.au](mailto:watchdog@acpmagazines.com.au)

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# What's a missing gigabyte?

APC Watchdog's recent story on fact vs fiction in terms of storage capacity riled up our readers, as did some other topics in this month's mailbox roundup.



Are you sure you're getting what you paid for?

**I**t was interesting to read in APC (May, page 22) the 'explanations' given regarding why a Seagate 160GB drive in reality has only 149GB formatted capacity. It seems the higher the capacity the larger the rip-off.

No matter how they dress it up, this is deceptive advertising and it is time it was stopped. Counting millions of bytes instead of true gigabytes conjures up images of dietary scams. Perhaps government agencies charged with consumer protection should act.

Seagate seem to be worse than others. I have a Seagate 250GB (232.9GB) disk which is almost a whole GB less than a Maxtor 250GB (233.8GB). They're both really nowhere near 250GB.

Companies could curry favour by advertising the drive as a 145+GB drive, and when the customer realises the capacity is actually 149GB their experience would be positive.

This 'truth' in advertising has been enforced in many other consumer markets but the computer market is still full of false claims.

**Ross McLeod**  
Aroona, Qld

## CAPTCHA YOUR DETAILS

The article 'Create CAPTCHAs in PHP' (APC April 2008, page 110) encourages web designers to break the law. The *Disability Discrimination Act* (Commonwealth, 1992) makes it unlawful to discriminate in employment, provision of goods and services and many other areas of life. CAPTCHAs often control entry to web sites through which essential information, and even bookings, are provided.

The graphics in CAPTCHAs are completely inaccessible to people who are blind because the assistive technology they use cannot decipher the graphics on which CAPTCHAs rely. As the article says, the graphics are specifically intended to be illegible to optical character recognition software. The graphics are also likely to be very hard to read for the several million Australians with limited literacy.

Further, if a complaint of disability discrimination is upheld, APC may then find itself liable under s122 of the DDA for having instructed, induced, or aided discriminatory actions.

There are many excellent resources on accessible web design eg. [www.webaim.org](http://www.webaim.org) and the World Wide Web Access: Disability Discrimination Act Advisory Notes

## ● letter of the month

### CRAP SOFTWARE

Last week my new laptop arrived. An Acer TravelMate 7720. It is a beauty and does everything I expected it would do and does it well. But... I am exhausted! Why? All because of software companies which insist on loading their incomplete, time-limited, programs onto 'my' new computer in order to force me to buy their programs from them.

It is a bit like buying a house and before you can move in some furniture company comes along and sets up samples of their furniture all through the house and says: "Isn't this wonderful? This is what you have to use."

If you accept it then you pay vast amounts of money to them. Then if you say you don't want it they walk out leaving it there, and you have to pay to have it carted away! It also leaves a bunch of marks on the floor (in your registry) and it messes up all your own arrangement of your own old furniture (the programs you have and want to use) and if you don't know how to remove these marks you have to get a renovator (computer technician) to come in and do it for you and he charges vast amounts as well.

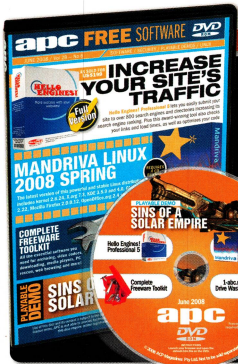
That's what a couple of companies did to me. That's why I'm a quivering wreck now. Leaving time-limited

programs on your computer is nothing but bullying of the customer. It is a bad trade practice.

**Joe Pedersen**  
Atherton, Qld

Joe wins this issue's Letter of the Month prize, a Logitech Cordless Wave Desktop keyboard and mouse set valued at \$179.95.





## APC DVD – LAST DISC OF AN ERA

This month's DVD disc is the last disc created by our DVD editor, Lachlan Grant, who has been building APC discs for the last 10 years. Lachlan is now off to new pastures and his last disc has got some great content: Hello Engines Professional is cutting-edge search engine optimisation software; there's the latest Mandriva OS for you Linux junkies; plus Hard Drive Washer and all our regular toolkit content.

Lachlan is being replaced by Peter Dockrill, who you might know as our Watchdog Editor. Chip Chat and your games reviewer. Peter will bring his own vision to the disc, so we're taking the opportunity to completely rebuild the APC DVD, with a new interface and new direction.

But in order for us to do that so quickly, we created a simpler design for this month to free up resources for the next generation disc to come out next month. So stay tuned for the July version of the DVD.

In the meantime, feel free to give us feedback on the DVD disc – if you like it, what you'd like to see on it, and if you don't like it, why we don't need one.

[service@acpmagazines.net](mailto:service@acpmagazines.net)



# apc

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at [www.hreoc.gov.au](http://www.hreoc.gov.au).

The Disability Discrimination Act has been in force since 1992. There are no excuses.

**David Morrell**  
 Ravenswood, Qld

### CAPTCHA PROBLEM

The technique described in your article 'Create CAPTCHAs in PHP' has a bit of a flaw in it: once a user has obtained one CAPTCHA and the corresponding MD5 digest, they are free to reuse that as many times as they like, embed it in an autosubmission script to spam your site, etc.

**Lawrence D'Oliveira**  
 Hamilton, NZ

### EVIL INTERNET BLOCKED

Regarding Lawrence Wong's letter in April's edition about school internet filters. I am also a student who has to go through these annoying filters. Once I had to do a PowerPoint presentation on the Nike brand. I was unable to access the Nike web site but I was allowed to access the Adidas one. Another time I needed to get some

info on the Vikings, which was blocked under the 'weapons' category. At my school even the Tech teacher is fed up with all the class not being able to use Yahoo or go to any of the Google Image search results.

It's probably just some old guy at the Department of Education who thinks the internet is evil. In the end, my solution was (and you should do the same) to find one of the few free hosting sites that aren't blocked (most of them are blocked under the Personal Site or Uncategorized category), get all your needed stuff before school and upload it there.

It's funny because all these filters actually stop us from doing our work and make us waste our time getting around them.

**Zed Milo**  
 Hurstville, NSW

### NO PROBS IN VICTORIA

I am wondering just why NSW is having so much trouble with its school filters! Victoria uses a very comprehensive blacklist which both the government and school

admins can edit! I am a high school student mature enough not to abuse the net and evidently the Vic government respects this.

We can make and use our own web sites without having them blocked — we can even make the sites at school. I am also allowed on the net using DSL. This isn't just a one-off: my school is one of the two most secure in its cluster.

**William Kulich**  
 Warragul, Vic

### WHERE CREDIT'S DUE

I read with interest your Watchdog article in the April issue regarding Billion's use of GPL-licensed code, and it occurs to me that you yourselves (and many others) are guilty of not giving credit where credit is due. You do many features on the 'Linux' operating system, without ever clarifying that the term 'Linux' refers only to the kernel written by Linus Torvalds, and that there would be no useable operating system without the GNU tools and utilities that feature heavily in all versions of the OS and which Linus himself

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Windows Server 2008



▲ The state of Vista: our readers aren't too convinced by 'rose-coloured' analysis.



utilised when originally writing the kernel. I realise that the name 'GNU/Linux' does not roll off the tongue and is not exactly marketable, but in the interest of fairness I think in future you should make this known to other readers who may be unaware of the full role that the GNU and the GPL play, especially after your open criticism of Billion for the exact same thing.

**Blake Walters**  
Donvale, Vic

## GET THE FACTS STRAIGHT!

In the Vista column of your March 2008 issue, James Bannan made the following statement:

"There are quite a few game titles on the market

that support DirectX 10, like Unreal Tournament 2007 and Eve Online, as well as some big-name games which have been designed around DirectX 10 and therefore only run on Windows Vista, like Crysis, Hellgate: London and Bioshock."

While I understand Mr Bannan's enthusiasm for his chosen operating system (although I can't say that I share his high opinion of Vista), I can't let that comment pass without noting that the second half is, in fact, completely untrue! I happen to own all three of the games listed and they all run perfectly well under Windows XP. Even being generous and saying that what he meant to say was that you can only get the DirectX 10 effects on Vista, this is also inaccurate as there's a readily-available 'user-generated patch' to allow the disabled DirectX 10 effects for Crysis to run under DirectX 9 on XP, for example.

**Brian Wright**  
Spring Hill, Qld

## VISTA LESS THAN SOLID

James Bannan's piece in the May issue shows a dedication to Windows Vista that is possibly tinted by rose coloured glasses.

Let me share another viewpoint. I am a software and hardware engineer with almost 20 years of frontline industry experience. I have used many operating systems including Unix, Linux, Windows, and Mac OS.

To serve my clients I have to keep up with the latest OS trends, so Vista was hot on my list of

required installs late last year.

While the ideas of what Vista could be are nice, the Vista released on an anticipatory world is nowhere near the "genuinely solid product" that James refers to. The number of device, file system, network and general OS issues present in Vista, and the patches, hotfixes, and registry tweaks necessary to fix them, mean that Vista as a robust system is not currently a reality that all users can achieve.

While I know that a number of issues can be put down to drivers and third parties, at the end of the day, the operating system relies on hardware to run it, and an operating system with no hardware to run on has no life outside of the package on the shelf.

I believe that James speaks truly of his own experiences but I think that the overwhelming user experience of many users including myself must be taken into account. Until basic operations such as networking, file copying and attaching external devices can be made fail-safe and fool-proof (and let's see what SP1 does in this respect), Vista will remain relegated to the 'it could have been great if it worked' pile.

**Ben Townsend**  
Blackburn, SA

## UNNECESSARY DOWNLOAD SIZE

What is it with Microsoft? Service Pack 1 for Vista, while available as a 465MB download, is also seen to be only about 65MB "if downloaded as updates online".

As always, Microsoft in its innate wisdom assumes that many people wishing to download this service

pack would be system administrators, so they will include these all language versions, which they then justify as common sense.

Please let me have the proper updated version without having to install all the other crap. It's certainly a pain and Linux is definitely a contender for my vote this year, and as Half-Life is seeing the light regarding porting games to Linux, best of luck to them. Phooey to Microsoft. I certainly hope Google can see its way clear to buy them out.

**John Vance**  
Melbourne, Vic

## A BETTER WAY

I've wondered for a while now (and maybe I'm naïve) as to why nobody is writing an OS and desktop GUI that will load instantly from fast built-in flash memory.

With 4GB flash modules available this will easily fit everything that an OS needs as well as providing room for the application run files.

The hard drive(s) should only be required to store the user and application working files. Any new applications would load themselves on the flash memory.

I know Linux will run off a USB stick (APC February, page 100) but this still relies on existing BIOS and chipsets that are based on a hard drive mentality. None of the big companies seem to be working on anything like this.

In this day and age we should have instant turn on.

**Hans Sanders**  
Athelstone, SA





This month in Labs. . .

## Changing your tune

**I**n our lounge room at home we have a very old PC. It's a 733MHz Mobile Celeron, with 64MB of DDR RAM shared with the GeForce 3-ish graphics chip, an 8GB hard disk drive and a DVD-ROM. Some of you might recognise that spec, and I'd dare say a good number of you have owned this

exact computer at one time or another. It comes in a black chassis with a big green circular badge on the top and no keyboard or mouse. Microsoft make it, but have since replaced it with a skinnier model in white. It's an Xbox!

These days, I use it to play back all of my digital media. Have done for years. It's such a workhorse piece of equipment: it's never skipped a beat, gets switched on and off daily, plays back nearly everything I throw at it and it's lucky to see a software update once a year. What's given this piece of once cutting-edge, now doorstop, box of technology such a long life of service is the software I run on it, Xbox Media Centre, or XBMC to its friends. XBMC is a ground-up,

written-for-the-Xbox media centre that plays a monstrously huge list of video codecs with a simple control mechanism. It rarely fails to play something, very rarely crashes and in my opinion is a paragon of non-commercially developed software. It's great.

But the era of XBMC in its original incarnation is almost gone. Xboxes are being thrown away instead of resold; the hardware's getting older, developing faults and is slipping into the twilight of computing's old age.

Fortunately, this is something I'm very excited about, the team behind XBMC aren't going to let it lie. Rather than going through the hassles (legal and otherwise) of porting the software

to a new generation of consoles, they've decided to port XBMC to Windows, Linux and Mac OS. So there's a very good possibility that by the time I'm ready to abandon my old Xbox, I'll still be able to run what I consider the benchmark for multimedia playback on a new platform.

Even better news for the XBMC team is that they've been accepted into this year's Google Summer of Code, and development is pushing on harder than ever. So the call's gone out: if you want to help them work on one of the best (in my opinion) open source, free apps out there and bring it to a whole new generation of users, then get in touch with them via [www.xbmc.org](http://www.xbmc.org). **BTTC**



SOME OF YOU MIGHT RECOGNISE THAT SPEC, AND I'D DARE SAY A NUMBER OF YOU HAVE OWNED THIS COMPUTER AT ONE TIME OR ANOTHER

NICK RACE — TECHNICAL EDITOR





The 780i: lightspeed, or even faster?

# Enspire Lightspeed 780i

Overclocked out of the box.

**A**s we've no doubt said before, Enspire has a long history at APC of turning in powerful, top-of-the-line PCs that never cease to impress and sometimes amaze.

Once again, Enspire has brought to the table the crème de la crème of desktop technology, and done it with aplomb. The Lightspeed 780i is a seriously fast machine. Let's take it from the top, piece by piece.

As the name might give away, the Lightspeed 780i is built around Nvidia's new 780i chipset. This chipset supports Intel Core 2 Duo and Quad processors with 1,333MHz front-side buses, double and triple SLI configurations and a whole swathe of connectivity. Enspire has chosen the EVGA implementation of the chipset, a brand long associated with the performance enthusiast community mainly in the US, but increasingly in Australia.

The EVGA 780i board sports a brand new Intel E8500 processor, the quickly adopted darling of the overclockers. At stock, the E8500

CONTACT Enspire Digital  
ONLINE [www.enspiredigital.com.au](http://www.enspiredigital.com.au)  
MARKET Performance enthusiasts  
PRICE \$4,397 (as tested)

Speed demon; overclocked; warranty.  
Non-portable; P182 case.

9/10

runs at 3.16GHz but will easily push up to and over 4GHz just with air cooling. Responding to that, Enspire offers this machine pre-overclocked to any of their customers at no extra cost. The downside is an increase of two to three days in the system's initial build to allow for adequate stability testing. Our test machine was supplied at 4GHz and was perfectly stable under the included Thermalright Ultra-120 Extreme heatsink. Four gigabytes of Patriot DDR-2 800 RAM were included in two 2GB sticks, allowing for easy upgrading in the future. The system ran Vista Home Premium 64-bit with full WHQL drivers.

Also sprouting from the board was the really impressive part. Enspire provided the test system with two Gainward GeForce 9800GTX 512MB cards in SLI. These

breezed through our gaming benchmarks, and if money isn't your primary consideration when choosing your desktop hardware, then there's much to be said for the 9800GTXs as a whole. In our Crysis benchmark, with every setting on high at 1,280 x 1,024, the system managed a comfy 52.8fps.

To keep this machine moving, Enspire equips it with two 74GB WD Raptor 10,000RPM drives in 'RAID' 0, along with a roomy 1TB WD drive for storage (and hopefully backup of the striped drives!). A Lite-On Blu-ray drive, plus another Lite-On DVD-RW 20x drive are included for optical discs, next and current gen.

All this is housed, along with a 1,000W CoolerMaster PSU in an Antec P182 case. The system is acceptably quiet (considering its spec) — it's well built and goes like

a dream. Our benchmarks back us up on that one.

PCMark Vantage clocked the system at a very respectable 6,325 points, while 3DMark 06 rocked in with an 18,504 thanks to the SLI'd cards. We also ran a few Cinebench runs to compare the overclocked system to a stock E8500. In the multiple core CPU run, Enspire's machine scored 8,597 to our stock runs at 6,366. Not a bad increase for an extra couple of day's wait.

Even so, as the man with the knives said, "but wait, there's more." The system is shipped with a few more extras to round out the package. A monitor, the Samsung 245B is a good choice for the gamer at 24in and a high refresh rate. There's also a Logitech G15 gaming keyboard paired with a Logitech G5 mouse, a Creative X-Fi PCI-E OEM sound card paired with Creative M5300 5.1 speakers, and the whole lot is covered by a one-year parts and labour warranty.

Nick Race



# Protac Green gPC

Inexpensive, cool and quiet.

**N**umerous OEMs are beginning to concentrate on making their products more environmentally friendly, or at least to appear that way. Now it's the system-builder's turn. Protac has created a green desktop PC light on power consumption, heat and price tag.

Often, there's a compromise to be made when going green. It's a case of having a high-end system, or an environmentally sound one; Protac has chosen the latter. The Green gPC is built around an all-in-one motherboard/CPU/graphics combo.

The model used is the VIA 1.5GHz core C7-D processor, with a single core, and a 16-pipeline stage processor with 128KB cache — it's not going to break any speed records. Built on the VIA CN700 chipset, it includes integrated graphics connected via an AGP bus,

as well as optimisations for MPEG decoding.

Protac has added 1GB of DDR2 memory, a 160GB WD hard disk drive at 7,200rpm, as well as an LG SuperMulti DL drive for optical storage.

What sets this machine apart is the OS. Protac has installed gOS Rocket Linux, a simplified Linux app with a raft of preinstalled and configured applications. With the inclusion of Sun OpenOffice, out of the box the gPC can do nearly everything you'd need on the web; including work.

The Linux OS means a much-reduced chance of virus and worm outbreaks; however, the tools are still there to let the kids work and play online. A distinct paucity of Linux games doesn't hurt at homework-time, either.

The real killer is the price. At \$456.50, many could consider it as a



CONTACT	Protac
ONLINE	www.protac.com.au
MARKET	Everyone
PRICE	\$456.50

✓	Inexpensive; performance; software.
✗	Budget keyboard and mouse.

**8/10**

second PC for the family. The price also includes a 16in widescreen LCD monitor from Chime, keyboard and mouse; the whole kit and caboodle.

We don't believe the green hype — but, the system's out-of-the-box experience with gOS, the rock-

bottom price (including the full bundle) and the value of the machine as a second computer shouldn't be underestimated, and for that, Protac should certainly be applauded.

*Nick Race*

# Acer Aspire L3600 AT423 HTPC

Tiny, full-featured and ready to go.

**T**rying to squeeze a full PC into a spot designed for a DVD player is a monumental task, and Acer's Aspire L3600 is an HTPC that most people wouldn't mind actually putting in their lounge room. It's small, black and innocuous, it doesn't spray (too much) blue LED light into your eyes, and, most importantly, has enough features and functionality to do what you want.

Built on an Intel Core 2 Duo E4600 at 2.4GHz, there's enough power for video encoding and HD decoding. There's a 500GB Seagate hard disk drive for storage, and a DVD-RW for playback and burning. A YUAN MPC788 hybrid tuner is built in, and a wireless keyboard, mouse and Media Center remote are bundled with the unit.

Ideally, we would have loved to see a Blu-Ray drive swapped out for the DVD-ROM. A considerable space saving was made with the L3600 by using an external power supply. All said and done the L3600 measures 250 x 200 x 60mm.

Testing showed the L3600 is eminently capable of running Media Center tasks in Windows Vista Home Premium, with playback of DivX, H.264 HD content and WMV-HD crystal-clear on our HDTV connected via DVI direct to the PC. The low-power graphics chipset (Intel G31) has just enough guts to run Vista (but won't be useful for any sort of 3D gaming).

The biggest let-down is the lack of HDMI port.

As a consequence, cabling the system becomes that much more complex, as the audio will need to be wired separately.

We really like this HTPC: the tiny form factor; its decent looks for the lounge room; plenty of computing power for HD content; it's quiet

and will do the job with a minimum of fuss. On the other hand, we have a wish list to improve it, and one huge omission (the HDMI) that balances it out. If you can take these points into account, then you won't be disappointed.

*Nick Race*



CONTACT	Acer
ONLINE	www.acer.com.au
MARKET	Everyone
PRICE	\$1,599

✓	Tiny form factor; solid hardware; silent.
✗	No High-Def drive; no HDMI.

**8/10**



# MacBook Pro

Running red-hot: all that snappy performance results in a pretty heated underside.

The latest revisions to Apple's high-end notebook line are as slick as ever.

If you like the MacBook Air but can't deal with its numerous limitations, perhaps you should give the MacBook Pro another look. At \$2,699 for the base 15in model, it's only a couple of hundred dollars dearer, and it's got the same sleek aluminum chassis that's turned so many heads with the MacBook Air. Plus, while it's nowhere near as thin, it's still slim and light for a desktop replacement.

The latest range of MacBook Pros (available in 15in and 17in models) have the requisite bump up in performance, graphics and storage space but also incorporate the multi-touch trackpad that was introduced in the MacBook Air. This feature lets you use two- and three-fingered gestures to perform actions like flicking through photos and music albums, zooming in and out of text and images and scrolling through a long web page or Word document.

Our review unit was the base-line 17-inch, with a Penryn 2.5GHz Core 2 Duo processor, 2GB of 667MHz DDR2 SDRAM, Nvidia GeForce 8600M GT graphics card (with 512MB of memory) and a 250GB 5,400rpm hard drive.

CONTACT	Apple
ONLINE	<a href="http://www.apple.com/au">www.apple.com/au</a>
MARKET	Everyone
PRICE	\$3,799 (17in)

Standard across all MacBook Pros is the built-in SuperDrive, 802.11n wireless networking and Bluetooth 2.1+EDR. Two USB 2.0 ports is limited for a machine this size — especially with no memory card reader — but it's otherwise decently appointed, with FireWire 400, FireWire 800, ExpressCard and Gigabit Ethernet.

For day-to-day use, the MacBook Pro is incredibly snappy, and it doesn't get any slower when you start throwing more complicated tasks at it (although the underside gets almost hot enough to fry an egg on). Converting a 700MB movie file to an iPhone-friendly video format took 38 minutes — by comparison, the same task on a 1.8GHz MacBook Air took a leisurely two hours and 33 minutes.

Apple claims the MacBook Pro is good for 4.5 hours of wireless productivity, which it would probably come close to with the power-saving features on. With them off, we were able to fit in two

✓ Slick design; preloaded software is excellent.

✗ Runs hot; have to pay extra for HD-resolution.

8/10

hours and 39 minutes of web browsing and Word processing before the system shut down, which is above average for a desktop replacement.

Apple's legendary attention to detail is well-represented on the MacBook Pro, with quality enhancements that are rare on other notebooks. The unique magnetic power adapter, for instance, prevents the notebook from crashing to the ground if you trip over the power cord. The keyboard is backlit, with an ambient light sensor that automatically switches it on when needed, and the battery has its own LED power meter so you can quickly check how much charge it has before you leave the office.

Preloaded software on a notebook usually consists of bloatware or trial applications, and this is another area where Apple computers shine. The sublime iLife '08 suite makes it remarkably easy for beginners

to make everything from photobooks and home movies to studio-quality music and web sites, and combined with the PhotoBooth application (which works with the built-in iSight webcam) and Front Row media player, it results in a notebook that's arguably the best there is for multimedia playback and creation. But we're disappointed that the remote control now costs \$29 extra rather than being bundled.

If you're after high definition, the MacBook Pro comes up short, with no Blu-ray optical drive or HDMI output — as found on many other high-end desktop replacements — and you'll have to fork out an extra \$150 if you want an HD-resolution screen. Nor does it have some of the features considered standard on an entry-level notebook, like a media card reader and fingerprint scanner.

But it's the support policy that ranks us most with Apple products: the standard warranty includes only 90 days of telephone support and one year of service, and to extend this to three years on the MacBook Pro costs a wallet-clenching \$579. Ouch.

Jenneth Orantia



# HP Pavilion dv9748tx

A desktop replacement with some serious multimedia muscle.

**I**f you're the sort that likes to make a bold statement with your notebook, this latest addition to HP's Entertainment PC range will suit you perfectly. The dv9748tx is the opposite of conservative, with curved corners and glossy surfaces that are offset by blue LEDs dotted around the keyboard and front edge. The notebook's unique 'Radiance' pattern on the lid and wrist-rest is tastefully distinctive, but we found the over-abundance of coloured lights (we counted 16 altogether) to be distracting.

The dv9748tx's family-size proportions leave no uncertainty that it's a stay-at-home machine rather than a

travelling workstation. It measures 396 x 285 x 42mm and weighs in at 3.49kg (or nearly three times the weight of the MacBook Air), but in exchange for the bulk you're well-rewarded with desktop-class fittings. The dv9748tx has a large and brightly-lit 17in 1,440 x 900 pixel screen, with a strip of touch-sensitive media controls below the display — supplemented by a small infra-red remote control that fits into the ExpressCard slot — and a dedicated number pad next to the keyboard.

For entertainment, it's one of the best-equipped notebooks on

the market thanks to a combo Blu-ray ROM drive/DVD burner and HDMI output, the latter of which, theoretically, lets you play the notebook's audio and video on an HDTV using a single digital connection. But getting it to play nice with a 50in full HD plasma proved problematic: the television didn't auto-scale for the dv9748tx's resolution, and even after fiddling with the display settings, the left and right edges were cut off. Worse, the HDMI port doesn't output the notebook's audio, so you'll have to either rely on the notebook's built-in Altec Lansing speakers (which are actually very good), or use a splitter on the headphone jack to pipe sound through the television.

All of the standalone Blu-ray players we've tested so far have had interminably long startup times, so the dv9748tx's quick load speeds were impressive. The quality difference between DVD and Blu-ray is immediately obvious on the HP, with the latter looking significantly clearer and sharper, but performance is disappointing. Playing our Blu-ray copy of *Superbad*,

the dv9748tx had difficulty keeping up with all the frames, resulting in a lot of jerky movements.

The usual cavalcade of wireless and wired connectors abound (as well as the near-standard webcam, fingerprint reader and 5-in-1 memory card slot), but the inclusion of only three USB 2.0 ports seems unusually small for a machine this size — we would've expected at least five on a desktop replacement notebook like this.

Running the show is a 2.5GHz Intel Core 2 Duo T9300 chip with an 800MHz front-side bus and 6MB L2 cache, and this particular configuration comes with the maximum 4GB of RAM. Graphics are taken care of with an Nvidia GeForce 8600M GS video card (with 512MB of dedicated memory), and the hard disk consists of two 250GB 5,400rpm platters.

The PCMark Vantage score of 3,685 was a lot lower than we were expecting for a Penryn chipset, but a clean install of Vista (without all the bloatware the notebook comes with) will likely boost this score considerably. The 3DMark06 score of 2,743 is similarly underwhelming for a discrete video card, and we're hoping that an update to the graphics driver will improve its poor performance.

Battery life isn't as important on a deskbound machine like the dv9748tx, but run-time results on our DVD run-down test were nevertheless impressive at two hours and 24 minutes from the standard eight-cell battery — for general use, this equates to around four hours of battery life.

**Jenneth Orantia**



CONTACT HP  
ONLINE [www.hp.com.au](http://www.hp.com.au)  
MARKET Everyone  
PRICE From \$3,499

✓ Packed with features; excellent battery life.  
✗ Performance doesn't match its potential.

**6**  
**10**



# Lenovo ThinkPad X300

If you can swallow the price tag, you won't find a more roadworthy notebook.

**I**t's not as thin or as sexy as the MacBook Air but, with its extra features, it doesn't need to be. The ThinkPad X300 forms part of a new breed of super-skinny ultraportables that don't compromise on features or performance. If you can afford the steep price tag, it's as close to perfect as we've seen for a machine designed for mobile professionals.

Clad in the classic ThinkPad black, it's tempting to pass it off as plain or uninteresting. Its appearance harks back to a time when notebooks were strictly business machines, and while the distinctive ThinkPad design is practically an institution in mobile computing, a few modern flourishes would almost certainly enhance its appeal for the less conservative.

Outside of a ruggedised notebook, you won't find a laptop that's better equipped for life on the road. The X300 is built like a tank, with a sturdy magnesium alloy base, the lid is constructed from a combination of carbon fibre and glass fibre — not unlike what's used in jets and Formula One race cars.

The 1.8in 64GB solid state drive is another nod to durability, but we're in two minds about its inclusion. On the one hand, it's certainly superior to a standard hard drive for performance, battery consumption and longevity, but unlike the MacBook Air, there's no option for downgrading to a standard (and larger) hard drive — a configuration that would easily make the X300 more affordable. With just under 60GB of the drive available, and Windows Vista taking up a hefty third of that, it leaves you with less than 40GB of free storage.

CONTACT	Lenovo
ONLINE	<a href="http://www.lenovo.com/au">www.lenovo.com/au</a>
MARKET	Everyone
PRICE	\$3,999

Road warriors are used to trading in features for extra mobility, so the lack of compromises on the X300 (which weighs 1.41kg with the optical drive) makes it all the more desirable. The 13.3in widescreen LCD is luxuriously spacious for an ultraportable, and the 1,440 x 900-pixel native resolution is higher than what most 14 or 15in notebooks offer. The screen uses a matte finish instead of a glossy sheen, but it does minimise glare and reflections, and the LED backlight makes it exceptionally brighter than a standard display.

ThinkPads are known for having excellent keyboards, and the X300 is no exception. Touch-typers will feel right at home with their fingers resting on the comfortable, full-sized keys, and for working in low-light conditions, there's also a handy 'ThinkLight' above the screen that illuminates the keyboard.

Ultra-slim profile notwithstanding, Lenovo has managed to cram in all the creature comforts taken for granted on a larger notebook. The right-hand side houses a DVD recordable drive that can be removed to lighten the travel

✓ No functionality compromises; durable.

✗ Expensive; utilitarian design.

8  
10

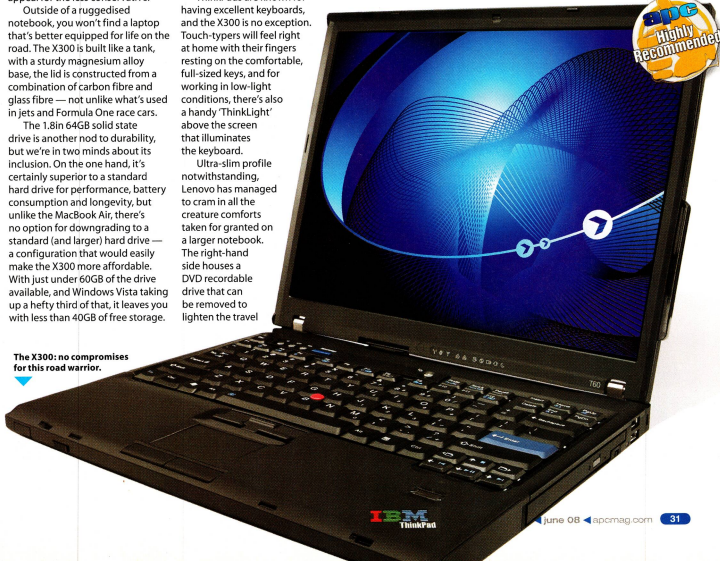
weight or replaced with an optional battery. It also has three USB 2.0 ports, Gigabit Ethernet and VGA. Wireless networking is taken care of with 802.11a/g/n Wi-Fi, and the X300 can be optionally configured with a SIM card to connect to Vodafone's HSDPA network.

Performance is usually the lowest priority on an ultraportable, but the X300 is still reasonably well-equipped, with a 1.2GHz Intel Core 2 Duo SL7100 chip with 2GB of RAM (configurable up to 4GB) and integrated Intel GMA X3100 graphics. Benchmark scores of 2,739

for PCMark05 and 444 for 3DMark06 are hardly spectacular, but they're above average for a thin-and-light notebook, and for workaday multi-tasking with Word documents and browser windows, performance is perfectly adequate.

With all the power management settings off, Wi-Fi disabled and the screen set to 40% brightness, the X300 chugged along for two hours and eight minutes on our DVD run-down test, which equates to just over three hours of real-world usage. The three-cell lithium polymer battery is replaceable, and if you fit it with the optional six-cell battery and replace the optical drive with an extra three-cell, the X300 can easily last a whole work day.

Jenneth Orantia



The X300: no compromises for this road warrior.



# ASUS EN9800GTX

The 9800GTX sits above the 9600GT but below the dual-GPU-wielding 9800GX2.

**S**pecifications-wise, the card actually shapes up similarly to the 9800GX2. It sports the same 65nm G92 core, 128 stream processors and a 256-bit memory bus. As with most cards we're seeing these days, the 9800GTX carries with it full PCI-E 2.0 support.

Due to the fact that Nvidia hasn't had to place two GPUs in close vicinity to each other like the 9800GX2, the clocks have gotten a very healthy increase. While the 9800GTX2 clocks come in at 600MHz on the core with a 1,500MHz shader clock and 2,000MHz DDR memory clock, the 9800GTX comes in at 675MHz, 1,688MHz and 2,200MHz DDR respectively. The 9800GTX is the first 9 series card to support the

new Tri SLI tech that gives you the ability to run up to three cards with a maximum of three GPUs.

ASUS has a fairly light package to go with the EN9800GTX; there's no full version game included here, just the standard TV-Out cable, power connector, DVI-to-VGA connector and Driver CD. ASUS are using the standard dual-slot cooler which is aesthetically different to the 8800GTS 512MB GTS one, though it does carry with it the same fan design at the back half of the card.

Firing up 3DMark06 we quickly see where exactly the card sits, scoring only about 15% behind the Dual GPU 9800GX2. Unreal Tournament 3 sees it again

just slightly behind the Dual GPU cards at both resolutions. We also see under Crysis at the lower resolution the 9800GTX is able to keep ahead of the 9800GX2 with the latter only just coming out ahead at the higher 1,920 x 1,200 resolution.

The 9800GTX is a great card for the price, though it's not the next-gen card so many people were hoping it would be. While it's not a bad

upgrade for people using a high-end 7000 series card or a mid-range 8000 series, if you find yourself with an 8800 Ultra, GTX or GTS, this offers no real upgrade.

Shane Baxtor



CONTACT ASUS

ONLINE [www.asus.com](http://www.asus.com)

MARKET Everyone

PRICE \$4,399

✓ Vibrant colours; excellent upscaling.

✗ Overheating problems; lacklustre built-ins.

6  
10

# PNY VERTO 9600GT

Competitive pricing and excellent mid-range performance.

**T**he PNY VERTO 9600GT has a 650MHz core, 1,625MHz shader and 1,800MHz DDR clock on 512MB of GDDR3 memory. PNY has opted to use a single-slot cooler with the fan positioned at the front of the card instead of the rear. The fan's also a little smaller but still manages to do a good job of keeping temperatures and noise levels down.

Connectivity is standard with our two Dual-Link DVI connectors

that support a monitor resolution of 2,560 x 1,600, along with a single TV-Out port. On the card we have an SLI connector that lets us run two of these cards together and a single PCI Express power connector located at the back.

It has an S-Video and Component/S-Video-out cable — along with a Molex to PCI Express connector and two DVI-to-VGA connectors.

Out of the box the 9600GT

doesn't have any dramas running an intensive game like Unreal Tournament 3 with a fairly high and very playable frame rate — not only at the lower 1,280 resolution but also the higher 1,920 x 1,200 one.

Loading up Crysis is where we begin to see some weakness in the card. At 1,920 x 1,200 you're simply not going to get a frame rate that you're happy with, but if you bring the resolution down and adjust the settings slightly you should find

yourself being able to get a decent frame rate.

If you have a 22in widescreen monitor outputting 1,680 x 1,050, it really is a great card to play games with high in-game settings at your native resolution but also has a bit of headroom to turn on a bit of anti-aliasing and antialiasing filtering.

The PNY VERTO 9600GT doesn't come with all the bells and whistles that we've seen on other 9600GT offerings. However, if you're looking for a new graphics card that doesn't muck around and simply offers you a competitive price on a very good model, the 9600GT from PNY might just be the card for you.

Shane Baxtor



CONTACT Bronet

ONLINE [www.bronet.com.au](http://www.bronet.com.au)

MARKET Everyone

PRICE \$229

✓ Single slot; great value.

✗ Lacklustre bundle.

8  
10

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## Thermaltake M9 VI1000BNS

**T**he M9 is a straightforward steel case with multiple drive bays, a 3.5in drive holder, an attractive external appearance and enough room to build a decently grumpy system.

Manufactured from rolled steel, it's heavier than aluminium models. The front of the case is a long run of 5.25in bays covered with removable metal grille from top to bottom. A single 3.5in adaptor for a floppy drive or card reader is included, as is a fan-cooled removable cage for the 3.5in drives, so it does away with 3.5in to 5.25in adaptors or rails.

CONTACT	Thermaltake
ONLINE	<a href="http://www.thermaltake.com.au">www.thermaltake.com.au</a>
MARKET	Everyone
PRICE	\$129

✓ Solid; looks; air flow.

✗ Extra 3.5in drive for upgrade.

**8**  
**10**

The case uses a top mounted power supply bay and includes a 120mm fan between the PSU and card slots. Full-length VGA cards won't have a problem fitting in the case, but combining them with a drive cage or optical drive might get a tad tangled.

The front bezel is made from very shiny black plastic in a wedge-shaped design down both sides. Power and reset buttons are metal,

and inset protecting them from accidental knocks. Two USB ports, headphone and microphone ports are available on the front of the case. Frankly, this is the bare minimum these days, but it does meet the standard. As a reasonably inexpensive case, with a good look and solid design, the M9 is right there. We don't have any hesitation recommending it whatsoever.

**Nick Race**

## Thermaltake DuOrb

**T**he DuOrb is one of the new school massively over-engineered coolers running amok in the market these days.

Where hefty cooling for overclocking was once the territory of water-cooling kits only, air coolers are starting to fill the middle ground.

These oversized and overpowered air coolers are designed for overclocking, and with chips like the Intel E8500 comfortably sitting at over 4GHz on air, this kind of cooler isn't entirely uncalled for.

The DuOrb takes a bit of

installing to get started, however, requiring a provided plate under the CPU socket.

If your motherboard already has one, it's going to have to come off, which can be tricky in some cases.

The cooler itself does an admirable job, as it helped us get our E8500 to 4.3GHz quite nicely, but there is one major problem with it.

As the DuOrb is designed to

extend over your RAM and components surrounding the CPU socket, you're limited to memory without an extended profile. Corsair DOMINATOR memory was the culprit here, and we couldn't mount the cooler with the RAM installed.

Normal-sized memory modules shouldn't have this problem, but keep it in mind.

**Nick Race**

CONTACT	Thermaltake
ONLINE	<a href="http://www.thermaltake.com.au">www.thermaltake.com.au</a>
MARKET	Performance enthusiast
PRICE	\$79

✓ Good CPU, component and RAM cooling.

✗ Some RAM might not fit under it.

**6**  
**10**

## Thermaltake DH-102

**T**hermaltake has a well-deserved reputation for producing quality cases, and its latest offering is no exception.

The DH-102 chassis continues the traditional horizontal desktop

design model for HTPCs capable of taking a full ATX motherboard, and is finished off in attractive brushed black aluminium. The most notable feature is the impressive 7in touchscreen LCD positioned on the

left side of the front plate.

The LCD connects to any available VGA output — onboard or video card — and runs at an impressive 800 x 600 resolution, meaning that you can actually interact with

the operating system via the screen. While the LCD certainly looks awesome and does a great job, we can't help but wonder its practicality — when would you really use it?

Inside the case, a full-size ATX motherboard sits flush against the 3.5in and 5.25in housing cages, leaving you with no room to create an effective cabling path. So, once you get past the case's visual impressiveness, you're left with the strong feeling that this is a case that has been designed around the LCD screen, with engineering aspects coming in a distant second.

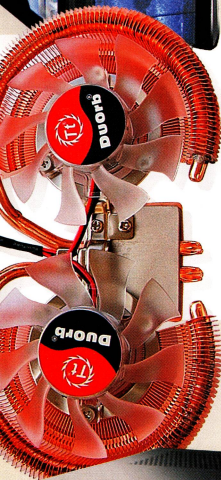
**James Bannan**

CONTACT	Anyware Computer Accessories
ONLINE	<a href="http://www.anyware.com.au">www.anyware.com.au</a>
MARKET	Everyone
PRICE	\$589

✓ 7in LCD: visually appealing.

✗ Little internal space; expensive.

**5**  
**10**





This LG shows a pretty picture, but there are some limitations.

# LG W1952TQ 19in LCD

Brand-name warranty and quality — but is that enough for a 19in these days?

**W**hen I was a lad a 19in screen was the stuff of millionaires. That's all changed; now we wonder how long it'll be till the 19in screen goes the way of the dodo. Until that day comes, the folk at LG are filling the niche for those looking for a smaller LCD where space or budget are tight.

The W1952TQ is a nice-looking screen. The glossy black bezel gives it a futuristic appearance. The lower edge of the face has a brushed aluminium look — it's actually plastic — where you'll find the various adjustment buttons and the power switch. It does require some assembly, as the base needs to be connected to the screen. This was quite simple, and the instructions are on the box.

Connectivity is via a DVI or VGA connector. There are no component, RCA, HDMI or S-Video connectors — the W1952TQ is really a computer screen and that's it! However, you can connect two PCs simultaneously

CONTACT	LG
ONLINE	<a href="http://www.lge.com.au">www.lge.com.au</a>
MARKET	Everyone
PRICE	\$399

✓ Clear display; good warranty.

✗ Limited connectivity options.

**6**  
**10**

to it and toggle between them by using the input button.

We powered the W1952TQ up and were disappointed to find a single stuck pixel in the top-right corner of our brand-new review unit, about 1cm down and 3cm in from the edge. LG's dead pixel policy for screens that are 19in or larger is replacement for any dead pixels, so if the same thing should happen to you there's a strong level of protection.

Other than the stuck pixel, we found the W1952TQ to be a very nice screen. Connected to a MacBook Pro via the supplied DVI cable we found that whites were crystal clear and text was crisp and easy to read. There are a number of pre-sets with different brightness, contrast and colour settings as well

as the ability to create your own preferences. At 1,440 x 900 pixels, we were able to view a pair of A4 pages side by side at 100%, though the 900-pixel depth means that you can't quite see the full page height.

Running the W1952TQ on our Windows Vista test system, we used Passmark's monitor test to examine its ability to render particular shapes and patterns. We couldn't detect any bright or dull spots indicating that this panel's backlighting was even. Diagonal lines didn't exhibit any jaggedness and ellipses rendered well, although some jaggies did appear. These were more noticeable with ovals rather than circles.

We put the 2ms W1952TQ to the test while viewing some DVDs. The display kept up with fast action

sequences and displayed detail clearly. As a multimedia monitor, it's great at moving the pixels, but there's no audio output or integrated speakers.

As is the case with many smaller LCDs our main criticism with the W1952TQ is the lack of positional adjustment. While there's a reasonable amount of forward and back tilt there's no height adjustment, so you'll need to keep a couple of phone books handy in order to get the display into an ergonomically sound position.

Other than the stuck pixel we found on our review unit we were quite impressed with the W1952TQ. If you're looking for a decent workhorse monitor for the office, and with solid warranty support, then the W1952TQ would fit the bill. However, at this price point you might find a higher-resolution 22in unit if you're prepared to look at less well-known brands.

**Anthony Caruana**





# LaCie 500GB Neil Poulton

Portable storage needn't look boring.

**P**reviously LaCie has teamed up with Porsche to design a line of drives; this time they have sought out Neil Poulton to add a bit of class to an otherwise dreary piece of tech. We wouldn't call it an attractive drive but it's simple black design is discrete. Keep a cloth handy though, as the surface attracts fingerprints very quickly.

The design lends itself very well to stacking, and when used with the FireWire interface, multiple drives can be chained together off a single port. A USB 2.0 cable, 6-pin to 6-pin FireWire cable and eSATA cable are all included.

It comes in a variety of capacities and capabilities. A USB 2.0 version comes in sizes from 320GB to 1TB, with a starting price of \$159. The unit we were sent was the top-spec triple interface model, which includes USB 2.0, FireWire 400 and an eSATA port.

Normally external drives consist of a standard PATA or SATA drive connected through a USB or FireWire bus, decreasing the performance. eSATA allows for the same speeds as an internal hard disk drive, since it is the same SATA connection used on internal HDDs.

The performance boost is very welcome. With the drive connected via USB, the Samsung-based drive achieved a score just shy of 40MB/s. Connecting the drive using the eSATA cable achieved a transfer rate of 112MB/s. The increase in transfer speed will be of most use to people who do video editing, though backup apps should see an appreciable improvement.

Using the setup wizard, the drive can be partitioned so that both PCs and Macs can use it in their respective disk format. It's a solid product that is an excellent choice if you demand



the best performance from your storage devices. It is quite well-priced, doesn't look or feel cheap, and offers almost all the interfaces you could want on an external drive.

Mitchell Oke

CONTACT	LaCie
ONLINE	www.lacie.com.au
MARKET	Everyone
PRICE	\$229 (500GB)

- ✓ Three interfaces; design.
- ✗ Poor backup software; no FireWire 800.

**7**  
**10**

# Western Digital Caviar SE16 WD640

Cost-effective performance for storage-seekers.

**T**his new line of drives utilises Western Digital's 320GB-per-platter technology. This has several benefits — the most important for many people will be price. Currently Western Digital has only released 320GB and 640GB models, but 960GB drives are surely on the horizon, close enough to 1TB without requiring four platters. Using two platters instead of three or four also decreases power consumption and noise levels: two very important things when building a PC for a living room or bedroom. With power consumption comes heat, another source of noise if you need to add extra fans to shift excess heat out of your PC.

While Western Digital may be up-to-date on its gigabytes per square inch, it has fallen a bit behind its rivals who are now packing 32MB of cache into their drives. Compared to the WD6400AAKS, which only includes 16MB, the speed difference for

most users would never be noticed, but performance junkies looking to eke the highest possible speeds out of their machines best stick to 10,000rpm drives. That is not to say it's slow, as performance benefits from the 28% increase in density over the 2500GB platters.

Specifications like the 7,200rpm spin speed, SATA 3Gb/s interface and power consumption hovering around 8W when reading and writing data are commonplace these days, but Western Digital likes to pack a few goodies into its drives to make them better value and more attractive to consumers.

The Caviar SE16 incorporates Western Digital's IntelliSeek technology to smooth the movement of the heads across the drive. This also decreases power consumption, as they do not have to restart moving repeatedly.

To increase durability and MTF SecurePark takes the heads off the platters when the drives spin up, down or when it is off, to make

sure the heads don't damage the drive when not in use.

On a cost-per-gigabyte basis this drive makes a lot of sense for space-hungry users who store lots of movies and music on their computers. At less than half the price of your typical 1TB drive, we can say for certain we'd rather buy two of these.

Mitchell Oke



CONTACT	Western Digital
ONLINE	www.westerndigital.com
MARKET	Everyone
PRICE	\$599

- ✓ Price; value; performance.
- ✗ 16MB cache, not 32MB.

**8**  
**10**





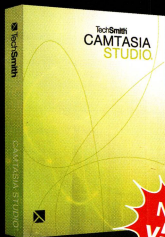
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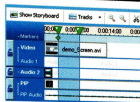
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# Thecus N5200

It's easy to set up, offers plenty of options and performs well.

**T**he Thecus N5200's spec sheet reads more like a PC than a drive enclosure. But that's because the N5200 is a sophisticated piece of hardware. With its Celeron M processor and 512MB of RAM it's capable of managing the valuable data you store on the five disks it holds.

Installing drives to the N5200 is straight-forward. Simply flip a lever on one of the disk caddies and attach the drive with the supplied screws. The caddies slide in easily and there's no wriggling or force needed to connect the drives.

We connected the N5200 to our router using its Gigabit Ethernet port and accessed the configuration utility through a web browser. You can install a setup application, for both Windows and OS X, from the accompanying CD, but there's little reason to use it. The N5200's status is reported via the LCD panel on the front of the unit.

The first step in getting the N5200 up and running is to configure the disks. There are plenty of options with support for JBOD and RAID 0, 1, 5, 6 and 10. It's worth noting that the N5200 is not a device for novices. The configuration utility gives little guidance as to the difference between the configuration options, so you'll need to do your homework. If you choose RAID 5 or 6 you can specify which disk in the array is to be designated as the spare in case you suffer a failure. Disks can be hot-swapped in the event you need to replace a drive. We removed and plugged in drives and the N5200 suffered no ill effects.

Once the array we created — a RAID 0 array with three drives — was operating it was

visible to the Windows and Mac systems on our test LAN. Access to folders on the array is managed from the configuration utility. Access via HTTP, FTP and SMB/CIFS is supported and each can be selectively disabled or enabled as needed. In addition there's support for media sharing via UPnP. When enabled, a 'My Media' folder is created on the disk array. Videos, music and photos placed in this folder can be seen from Windows Media Player. There's no out-of-the-box support for iTunes.

Performance-wise the N5200 didn't disappoint. We copied a 350MB video file to the array from our Windows Vista system to a

mapped share and it was across in just a few seconds. To really test the drive, we played the video on our Windows and Mac systems simultaneously, skipping forward to different parts of the movie. It didn't miss a beat.

As well as the Gigabit Ethernet connection, the N5200 sports a pair of USB ports for either sharing other external disks or printers. According to the documentation, the USB ports support Wi-Fi adaptors, turning the N5200 into a wireless RAID array.

To top things off, the N5200 has an RS232 port, so it can be connected to (and operate with) a UPS, and there are power

management settings that will power the N5200 on and off at specific times. Used in a small office, you can schedule the device to turn off outside of work hours and turn on when the workday starts.

Our only criticism of the N5200 was its noisiness. There's simply no way it can be used as a desktop unit. There are a couple of fans to keep everything cool that make a significant hum when in operation. However, given that the N5200 is pitched as an SMB or SOHO device, this isn't a show-stopper, as we'd expect that it'd be housed in a utility room rather than on a desktop.

Anthony Caruana

**The N5200: excellent performance — but be aware of the noisiness.**

CONTACT Altech  
ONLINE [www.thecus.com](http://www.thecus.com)  
MARKET SMB  
PRICE \$1,050

✓ Setup; performance; flexibility.

✗ Noisy.

8  
10



# QNAP QBack 35S

A simple backup solution, although it runs hot.

**T**he QBack 35S is a SATA drive enclosure with external USB 2.0 and eSATA interfaces. If your PC lacks an eSATA interface but has one spare on the motherboard, QNAP provides a suitable plug that can be easily installed. For testing we used the USB 2.0 interface to a Dell Inspiron 1520 and Apple MacBook Pro.

The QBack 35S comes as an empty case so we had to install a drive. We chose a Western Digital 500GB SATA unit. Installation was straightforward, and the instructions are clear and easy to follow.

For Windows users, QNAP provides QBack — its own backup software. Once the installation was complete it provided a visual walkthrough on how to install a hard drive into the QBack 35S.

QBack lets you split the available disk into two sections — one is

public and the other is encrypted and only accessible by entering a password. Each appeared as a separate drive letter on our Vista system.

The backup process is very easy. Checking a single check-box will back up your entire drive to either the public or secure disk. From that point, it's only a matter of waiting for the contents of the drive to be backed up. To restore a file you can either browse the drive and copy the required files manually or use the QBack step-by-step restore tool. Both worked equally well in our testing.

Our only concern with the QBack 35S was that the casing felt quite warm once the drive had

been running for about three hours. This didn't cause a failure during our testing, but we're always a little worried by hard drives that run particularly hot as this can shorten their lives.

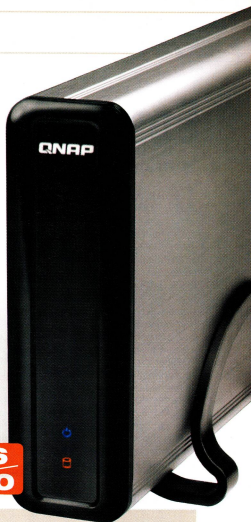
The QBack 35S is a competent unit. Installing the device was a nice and easy affair and the accompanying software adds value to the overall package. Given that the drive enclosure market is very crowded these days, the total package of enclosure and backup software make this unit worth considering.

Anthony Caruana

- CONTACT Bluechip Infotech
- ONLINE www.qnap.com
- MARKET Everyone
- PRICE \$99

- ✓ Good software; easy setup.
- ✗ Runs hot.

6  
10



# QNAP TS409 Pro

A four-bay NAS to hold a set of SATA drives for your LAN.

**F**or testing the Pro, we installed four drives: two 500GB and two 320GB disks. The physical drive installation was quite simple, although pushing them in so that they

connected to the SATA socket took a little more wiggling and force than we'd have liked. Once the drives are in, startup takes about a minute. LAN connectivity is via a gigabit port and

there's a USB interface on the front as well. A pair of USB ports on the back can be used for printer sharing or adding another external disk.

When it came to initialising the disks we had a choice between addressing each disk as a separate volume or setting up either RAID 0, RAID 1 or a Linear Disk Volume.

As part of the set up process, the TS409 Pro creates a number of default folders. The 'Public' folder is for sharing files, and there are folders for sharing a central iTunes library and running a web server. Of particular interest was the provision of MySQL within the TS409 Pro firmware. Effectively, it means that if you configure your network correctly you can run a web server that can handle up to 4GB of data

if all the drive bays are filled.

Setup wasn't particularly easy but, once accomplished, we were able to transfer files back and forth from the TS409 Pro with no problems. File shares worked correctly and we were able to create user accounts that limited access to specific shares.

Hot swapping of disks is supported depending on the RAID configuration used. The user manual, on the accompanying CD, does a good job of explaining the differences between the different options.

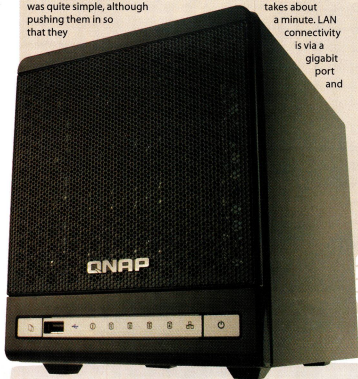
Given our experience of the TS409 Pro we find it hard to recommend. Once it was up and running it worked as expected but the difficulties we faced setting it up were substantial.

Anthony Caruana

- CONTACT Bluechip Infotech
- ONLINE www.qnap.com
- MARKET SMB
- PRICE \$799

- ✓ Lots of storage; web server.
- ✗ Difficult setup.

4  
10







# Epson Stylus Photo R1900

With an all-new ink set, Epson's new high-gloss printer produces fantastic prints.

**T**he R1900 has quite a large footprint at 62 x 32 x 21cm without the paper feeds extended, but a large-format printer is always going to take up more space than an A4 model. The absence of Ethernet connectivity is made up for to a limited extent by the provision of two USB ports. PictBridge support allows printing directly from cameras, but we were disappointed by the absence of a memory card reader.

Paper is supported from 10 x 15cm through to borderless 329 x 483mm (A3+), along with envelopes and CDs/DVDs. The paper feed has a 120 A4 sheet capacity. Holders on the back of the device allow the R1900 to handle roll paper, allowing the printing of large panoramas and consecutive images. A built-in

cutter would be useful, but the best the R1900 can do is print a grey rough-cut line to guide scissors or a knife to separate images before they are finished accurately on a trimmer or guillotine.

Installation is typical for all of Epson's range, with a 'start here' poster guiding you through the physical setup. Drivers are available for Windows 98SE and greater, and Mac OS 10.2 through 10.4.10. The CD includes four of Epson's standard utilities, Print CD (for disc labels), Web-to-Page (resizing web sites to paper), Easy Photo Print (for digital images), and Creativity Suite (file management). Apart from the setup poster, documentation is limited to an on-screen manual.

The R1900 is the first printer to feature Epson's new UltraChrome High-Gloss2 resin coated pigment ink. Like its predecessor, the R1800, there are eight cartridges, including two blacks. Unlike some earlier

CONTACT	Epson
ONLINE	www.epson.com.au
MARKET	SMB
PRICE	\$1,099

- ✓ Clean, even gloss; quality reproduction.
- ✗ No memory card reader.

**8**  
**10**

models where matte and photo black cartridges had to be manually changed, the R1900 automatically determines which ink to use according to the chosen paper type. A new Gloss Optimiser is claimed to produce less bronzing, resulting in a more even finish, and that was certainly the case with our test prints. One of our pet hates is the way some printers produce photos with glossiness that varies according to the amount of ink deposited across the sheet, and the R1900 delivered very even results.

Cartridges cost \$22 each, and Epson estimates the life of the matte black cartridge at 520 pages, the five colours at 915 and the gloss black at 563 pages. If this is accurate, the cost of printing is not excessive given the quality.

And that quality is very high. The R1900 prints at 5,760 x 1,440dpi, with ink droplets as small as 1.5pl. Our test photos were among the best quality we have seen from inkjet printers. Comparing the results with output with some

Epson models that use Claria dye ink, we found that skin tones were noticeably more natural with more distinct highlights. Epson says the use of orange ink in place of the blue used in some models improves skin tones, and we won't argue with that. Furthermore, both coloured and greyscale gradients had visibly greater colour variation. While images appeared markedly brighter, this wasn't achieved by oversaturating the colours.

Whilst not a major concern with this category of printer, text was clear and crisp, and business graphics of a high quality. You wouldn't buy it to churn out office documents, but it's good to know the R1900 can do a good job on non-photographic work when called upon.

Nominal print speed for a A4 sheet of text is 12ppm. In our tests the first sheet emerged after 50 seconds, with the second slightly slower than the advertised speed. A 10 x 15cm photo emerged after 58 seconds, while an A3+ image took 9 minutes.

Epson's latest definitely lives up to its billing as a professional-quality photo printer.

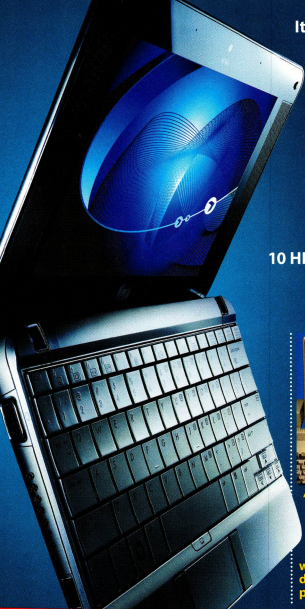
**Stephen Withers**



▶ A consistent, even finish is one of the R1900's strengths.

# Our **BIGGEST** reader competition **EVER!**

## Win one of 10 HP 2133 ultraportable PCs



It is undoubtedly the sexiest ultraportable PC to cross the testbench of APC Labs. It has a sleek aluminium chassis, a keyboard that's 92% full size, a 1,280 x 768-pixel 8.9in screen, an ExpressCard slot for 3G broadband cards, a 160GB hard drive, it weighs just 1.2kg and we want one... drool!

In fact, you might want one too. That's why we have 10 to give away to APC readers, to celebrate the launch of the new [apcmag.com](http://apcmag.com)!

### How to win the **ULTIMATE** ultraportable

All you have to do to be in the running to win one of 10 HP 2133s is write a review of your current PC. It doesn't need to be a current-model PC — you could review anything from a Commodore 64 to a quad-core Core 2 Duo beast as far as we're concerned.



"The Amiga 500 was ahead of its time... the games had real playability, and the graphics hardware was killing PCs of the day, with awesome parallax scrolling..."



"I decided to build my own PC, comprising a Thermaltake M9, Nvidia 7900 and 2 x 1TB hard drives. Why? Because I wanted utmost control over my system spec..."



"I knew it was over between me and Vista when I saw her in the shop. A beautiful 24in iMac. She had feline looks and big-cat power inside, thanks to OS X Leopard..."

## Review your own PC to enter the competition now! [www.apcmag.com/reviewandwin.htm](http://www.apcmag.com/reviewandwin.htm)

#### Competition rules

This competition is a game of skill. To enter the competition, readers must (1) sign up for an account on [apcmag.com](http://apcmag.com) (2) create a discussion thread in the 'Reader Review' section of the APC forums and (3) post a review of their own PC in that thread. (4) The review must comply with APC's existing forum rules. A reader may enter as many times as they like as long as the review is of a different computer each time. The competition commences Monday 21 April 2008. The competition finishes on Friday 15 August 2008. Winners will be announced on [apcmag.com](http://apcmag.com) by Friday 15 August 2008. Winners will be contacted via their pre-registered [apcmag.com](http://apcmag.com) account email address. Entrants who do not win will not be contacted. Reviews submitted become property of APC Magazines Ltd. APC Magazines Ltd will not be held liable for technical issues, including but not limited to web site failure, loss of data or other computer or internet-related problems that influence the result of the competition. If any of the winners cannot be contacted within 30 days of the announcement of winners, APC Magazines Ltd reserves the right to reallocate the prize to another entrant. Open only to residents of Australia and New Zealand. This competition is not open to staff or contractors of APC Magazines or PBL Media, or parent companies or subsidiaries. The official rules of the competition are available at <http://apcmag.com/reviewandwin.htm>. Only valid entries that meet the requirements will be considered as part of the competition.



# Philips Internet Phone VOIP841

Convenience and style... for a price.

**T**he handset itself resembles a stretched candy bar mobile phone rather than the Euro styling associated with most DECT devices. The design is quite elegant, with a glossy black finish. The handset is powered by two AAA nickel metal hydride cells that are kept topped up by the charger cradle.

The cradle runs from a plugpack separate from the charger's, so you'll need two power sockets. This arrangement is convenient if you need to install the units away from each other but is an irritation when both live on or near your desk.

Although the handset's colour display is just 4cm diagonally, it is easy to read due to good brightness and contrast.

The default settings include DHCP and the automatic installation of updated firmware,

so most users will have nothing to do apart from plugging in the components and making calls — which is how it should be for a phone. The three connectors — network, PSTN and power — use different plugs making installation practically fool-proof.

The necessary cables are included — a 2m Ethernet cable plus a phone cable with an RJ-11 connector at each end. It would be helpful if an Australian 605 phone plug adaptor were also in the box. But at least it's better than an RJ-11 to 605 cable, as you may want to connect the base station to the answering machine socket of a desktop fax/phone or multifunction device.

The quick installation leaflet is clear and appropriately illustrated, but the manual is only provided as a PDF file on an accompanying CD. This is not very convenient as

there's no guarantee that you'll be sitting at a computer when using the phone.

Voice quality is adequate (though not outstanding) on landline and Skype calls, and the speakerphone setting works well. The wireless range was sufficient to give good reception beyond the boundaries of a traditional suburban block.

The VOIP841 is very convenient if you use Skype a lot, but a generic DECT phone combined with an ATA or voice-capable router is probably cheaper if you prefer standards-based VoIP.

Stephen Withers

CONTACT	Philips
ONLINE	<a href="http://www.philips.com.au">www.philips.com.au</a>
MARKET	Everyone
PRICE	\$299.95

- ✓ Cordless Skyping without a computer.
- ✗ Audio quality could be better.

**7**  
**10**



# Billion BiPAC 7300GX 3G/ADSL2

The BiPAC 7300GX is something of a Swiss Army knife.

**I**t's said that first impressions count. Sadly, the 7300GX did not impress when we started testing. The Quick Start Guide showed us how to connect all the leads and plug things in but that was about it. There was no guidance on how to actually configure the unit.

Having negotiated our way through the setup process we found that the 7300GX offers a plethora of configuration

options. You can choose to use either ADSL2+ or a 3G card for network access. Both can be connected at the same time but you need to specify which is to be the main interface for internet connection.

When we tested the 7300GX with a 3G card we found that it was noticeably slower than having the

card directly connected to our test systems. The ADSL connection we tested with (through BigPond) connected without any hassles. It's a good idea to have all your setup information handy though.

The upload and download speeds were reported correctly by the modem and we found that web browsing, email and FTP worked well. It's difficult to assess the speed of the ADSL connection as many factors, such as proximity to the telephone exchange, influence ADSL connection speed. However, the 7300GX was no slower than the standard modem supplied with the ADSL service by Telstra.

The lack of Gigabit Ethernet and 802.11n is a significant problem. With new computers

shipping with Gigabit as standard these days and 802.11n expected on current notebooks, the connection speed, particularly when sharing data across the network, is a serious limitation. It's not likely to be a significant bottleneck for web browsing where most ISP connections are slower than 802.11g or 100/100, but if you're planning to move large files across your network or to stream media then this will be an issue that needs consideration.

There's a lot to like about the Billion BiPAC 7300GX. Its flexibility with twin paths to the internet is a great feature, although the tricky setup and poor documentation suggest that this isn't a device for someone looking for a plug-and-play experience.

Anthony Caruana

CONTACT	PCRange
ONLINE	<a href="http://www.billion.com.au">www.billion.com.au</a>
MARKET	Everyone
PRICE	\$269

- ✓ Connectivity options.
- ✗ Difficult setup; poor documentation.

**6**  
**10**





# 3 NetConnect Mobile Internet

Being away from the home or office doesn't mean you have to be offline.

Internet access is now a necessity. It's no longer a luxury but is approaching the importance of electricity and telephony as a utility. Like those essential services, many of us can't go without internet access just because we're not at home. 3's NetConnect service delivers a reliable internet service — although there are some gotchas to watch out for.

3 offers its service to Macs and PCs through either a USB device (the Huawei E220) or an ExpressCard (the Qualcomm Merlin XU870). We tested the service with the Merlin XU870 on a MacBook Pro running OS X 10.5.2. It's worth noting that the Mac users only get basic connectivity while Windows users get a more advanced software installation that provides connection monitoring and SMS functions. On the Mac, you can connect and that's it. If you wish to monitor network traffic you'll need to find a third-party utility.

Once the appropriate drivers and software were installed we plugged the NetConnect in and

were online a few moments later. Using HSDPA, 3 suggests that a maximum download speed of 3.6Mbit/s is theoretical although speeds between 600Kbit/s and 1.5Mbit/s are typical. We tested the service extensively throughout Melbourne and found that 1Mbit/s was achievable most of the time. Uplink speed is specified as up to 384Kbit/s. We found that speeds in the range of 100–200Kbit/s were achievable. However, it should be noted that the speeds to achieve are largely dependent on the sites and services you access.

3's HSDPA coverage area is limited to the capital cities and surrounding suburbs. We used the 3 NetConnect service in Melbourne's CBD, the airport, in taxis and on trains and maintained a steady connection although we did slip between HSDPA and 3G coverage. This is made obvious as the LED on the Merlin XU870 card changes from yellow to blue. Outside those areas, the LED turns to green indicating that we're in a GPRS coverage area.

Once you wander into GPRS

coverage, you are actually off 3's network and are roaming onto Telstra's network. As a result, other than the first few megabytes, your usage is not covered in the usage cap. Each MB of traffic in the Telstra zone is charged at \$1.65. Effectively, this means that 3's service is not great value if you're planning to extensively use it in non-coverage areas. The use of Telstra's network when you're not in a coverage area is a double-edged sword. It's good to maintain connectivity but it can get expensive pretty fast.

Although we tested the Merlin XU870 specifically this time, we have used the Huawei E220 USB modem in the past. This is the same modem that Optus and Vodafone use. Although 3 doesn't offer Linux support there are plenty online tutorials providing instructions on using the hardware with various distros.

As far as value for money goes, 3's prices

are close to the market's best. For beginners, the 1GB plan costs \$15 per month for data and \$5 for the card over 24 months. The \$49 per month plan delivers 4GB. Pricing plans are easy to compare on the 3 web site. You can order from a 3 store or online where, depending on what deals are on, you can often get a credit towards your first couple of bills.

3's NetConnect service is definitely worth a look if you need internet access from your notebook while you're on the go. As long as you limit use to coverage areas it delivers good value for money, although those frequently heading to rural areas may need to look at other services.

Anthony Caruana

- CONTACT 3
- ONLINE [www.three.com.au](http://www.three.com.au)
- MARKET Everyone
- PRICE From \$15 per month

✓ Price; performance.

✗ Mixed compatibility with OSs; coverage.

6  
10



Good value for money (just make sure you stick in the right coverage area).



The WRT100 supports 802.11b, g and n but not 802.11a, so you're stuck on the 2.4GHz frequency.

# Linksys WRT100 Wireless Router

Pretty easy-to-use routing, but does it live up to the marketing hype?

**L**inksys boasts that its latest wireless home router, the WRT100, offers excellent coverage and can be up and running in just a few minutes. So, are these realistic claims just marketing guff? We put the WRT100 to the test.

Installation began by popping the accompanying CD into our test system, a Dell Inspiron 1520. Given the increased market penetration of Linux and OS X it's annoying to find that the installation requires access to Windows in some way. However, you can browse the CD for the user guide that gives instructions on accessing the router without resorting to a specific application.

The installation wizard guided us through the connection process so that the PC, router and cable modem we tested with were all playing nicely. All told, this process took about 10 minutes. However, at the end of it, the configuration utility couldn't detect the router. To be fair, we're pretty certain that the problem lay with the vagaries of Vista's networking underbelly as the router was accessible via a web browser. So, we followed the time-

➤ **CONTACT** Linksys  
➤ **ONLINE** [www.linksys.com.au](http://www.linksys.com.au)  
➤ **MARKET** Everyone  
➤ **PRICE** \$130

✓ Wireless range; setup.  
✗ No Gigabit.

**7**  
**10**

honoured tradition of rebooting the computer in hope, re-running the configuration application and... voila! All was well. Once the router was detected, we provided it with connection information. Next, we were prompted to change the router's default password and the configuration utility tested the internet connection. All of this completed without a hitch.

The WRT100 uses MIMO (multiple-input, multiple-output) in order to increase the wireless throughput. This is part of the 802.11n Draft 2 that is expected to be finalised later this year. The use of MIMO is supposed to increase the range of your wireless router, although to get the full benefit, Netgear suggests that you install one of their wireless cards to your computer. Given that many current laptops support the Draft-N standard we preferred to test with integrated network cards as we

expect that's what most APC readers would use. Wired connections are limited to 10/100 — no Gigabit.

The WRT100 supports 802.11b, g and n — there's no 802.11a support so you're limited to connections using the 2.4GHz frequency band. In changing settings, we found that the web browser interface was somewhat annoying, as each change we made had to be saved as we went along or we'd lose settings. All the usual wireless security settings were there with support for MAC filtering, encryption and SSID broadcast available.

If you're planning to use the WRT100 in your home and have kids, there's URL blocking, although it's limited to just four addresses for some reason. The same is in place for keyword blocking. We did find one configuration setting curious: you can set the timezone the router will be used in but Linksys seems to

believe that all of Australia is in a single timezone. If you're in the western or central zones you'll need to find a country that matches your timezone if you plan to have the router automatically check its time.

Linksys' boast about signal strength seems to be quite reasonable. We took our test laptop for a walk and, at about 30 metres, signal was still running at about 35%. We had an Apple Airport Extreme base station sitting near the WRT100 and its signal wasn't quite as strong, although both were still usable at that range.

Linksys bundles a copy of Norton Internet Security for XP and Vista on the installation CD. The version number is unspecified on the packaging or the installer, but we found it was version 10.2 making it a couple of years old. It includes a 60-day trial subscription to antiviruses and other security updates.

The Linksys WRT100 Wireless Router is a competent — if unspectacular — router. It's reasonably easy to set up and offers good wireless range.

Anthony Caruana

# Samsung PS50P91FDX

Too hot to handle.

**T**his 50in full HD panel is Samsung's flagship plasma, and it looks every bit the role of an expensive HDTV, with slickly curved edges and highly-polished surfaces.

Samsung's on-screen menu system is one of the most user-friendly we've come across. The obligatory brightness, contrast, sharpness, colour and tint controls are available, and it offers advanced options like digital noise reduction and adjustable HDMI black levels.

But it's not without its quirks. Other HDTVs usually remember the settings that you've calibrated for each input source so you can have different configurations for free-to-air, cable, gaming and Blu-ray, but the P9 kept reverting back to the overly-saturated Dynamic mode whenever we changed sources.

Another thing we noticed is that the P9 gets exceptionally hot. What's worse, it appears to affect sources

that are connected via HDMI, resulting in faint jagged yellow lines around certain objects on the screen when it gets overheated.

The first test we threw at it was Blu-ray, and the P9 puts in a strong performance. The picture is razor sharp with plenty of contrast and detail, and colours are exceptionally bright and vivid. Black levels are excellent, and while the P9 has no problem producing bold and eye-catching colours, it struggles to display subtler shadows and hues — particularly for darker scenes and objects — which means high-def movies and games lack the depth found in similarly-priced plasmas.

Playing standard-definition content like free-to-air TV and DVD is usually the biggest challenge for a HDTV as it needs to upscale everything to fit the larger resolution. In this regard, the P9 does an excellent job, removing

most of the noise and blurriness that's inherent to lower-quality sources. However, the built-in speakers are sadly lacking — for the best experience, you'll want to connect the P9 to a quality stereo system.

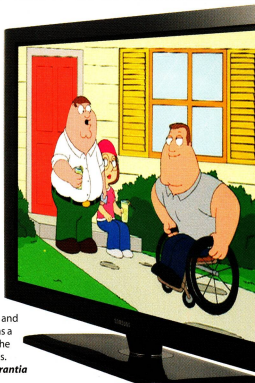
Inputs on the P9 are plentiful, including three HDMI 1.3 ports, two sets of composite and component, a single S-Video and a D-sub VGA. It also has a built-in USB 2.0 port for displaying pictures from a digital camera, and the supplied tabletop stand has a swivel base for easy access to the side and rear-mounted controls.

Jenneth Orantia

- CONTACT Samsung
- ONLINE [www.samsung.com/au](http://www.samsung.com/au)
- MARKET Everyone
- PRICE \$4,399

- ✓ Vibrant colours; excellent upscaling.
- ✗ Overheating; lacklustre built-in speakers.

**6**  
**10**



# TEAC HDR1600T PVR

Refreshingly simple.

**I**f you're looking for a PVR that's as easy to use as a VCR, the Teac HDR1600T might just be what you are looking for.

The HDR1600T automatically scanned for all available digital channels in our area and within a few minutes was ready to record both high and SD broadcasts.

Aesthetically this unit is not much to look at, being a basic black box with a few simple controls on the front. The LED display tells you what channel you are on, but not much else. On the back are the basic analogue outputs (stereo audio, composite, component,

SPDIF optical and HDMI). The HDR1600T comes with a 250GB hard disk, which can be upgraded to 500GB at an authorised service centre (for an additional cost). Whilst not huge, the hard disk will store approximately 60 hours of high-definition or 125 hours of standard-definition programming.

The unit has dual-HD tuners, which means you can watch one program whilst recording another

or even record two programs simultaneously whilst playing back a third.

In the audio area, this unit does suffer from some limitations. There is no inbuilt Dolby surround decoder, which means that you are limited to stereo downmix through the analogue outputs or you require an external Dolby surround decoder with optical input.

The unit is limited to 1080i

rather than true 1080p high definition; however, since no Australian network is currently broadcasting 1080p this is no great loss for now.

Provided you are content with a simple PVR, there is little to fault with this unit. However, if you want to copy recordings onto other media, you will be out of luck since there is no Ethernet port, nor is there any other way to get programs off the PVR. The lack of connectivity also limits the unit to playing back TV only since there is no way to get content to it.

David Neiger

- CONTACT Teac Australia
- ONLINE [www.teac.com.au](http://www.teac.com.au)
- MARKET Everyone
- PRICE \$599

- ✓ Easy to set up and use.
- ✗ Can't port recordings; no built-in surround.

**7**  
**10**







# Nokia N82

No-holds-barred functionality in Nokia's latest smartphone.

One of the things Nokia does best is build smartphones that are feature-packed without being overly complicated. Such is the case with the N82, an attractive and decidedly un-brick-like Series 60 third-edition smartphone that goes all out on the functionality front. It has HSDPA (3.6Mbit/s), 802.11b/g Wi-Fi and Assisted GPS, as well as a high-quality five-megapixel camera and enhanced multimedia capabilities.

The N82's feature set is almost identical to that of its much-vaunted older brother the N95 but with a few key differences. Nokia has wisely opted for a candybar-style form factor rather than the dual slider design of the N95 — a decision we can only assume was influenced by the quality-control problems that stemmed from the slider.

What we like most about the N82 is that it looks and feels like a regular mobile but has the brains of a high-end smartphone. The shiny chrome faceplate gives it a luxury feel that's complemented by the matte silver trim and

- ★ **CONTACT** Nokia
- ★ **ONLINE** [www.nokia.com.au](http://www.nokia.com.au)
- ★ **MARKET** Everyone
- ★ **PRICE** \$959

champagne-coloured rear, and the silver keypad isn't as uncomfortable as it looks (but if you're a heavy texter or emailer, you'll probably start missing flat keys after the first few hours of thumb-grazing). The N82 also has a built-in accelerometer that's meant to change the screen orientation when you hold it sideways; in practice, it worked less than half the time, and we'd usually have to shake the phone a few times to get the orientation switching working.

Whether you're using it for work or play (or, more likely, both), the N82 is extremely capable. For business use, it comes with an excellent web browser, email application and VoIP client out of the box, and there are hundreds of free and commercial applications available for extending its functionality. Downtime is just as well-accommodated with the

- ✓ Loaded with features; snappy performance.
- ✗ Verbal GPS guidance costs extra.

**9/10**

excellent music application, powerful speaker, full-sized 3.5mm headphone jack and support for the N-Gage gaming platform, the latter of which uses a system similar to Xbox Live for online gaming. Built-in memory is a meagre 100MB that's shared across all of the applications, but it's supplemented by the 2GB microSD card in the box.

Snap-happy users will find lots to like with the N82's industry-leading five-megapixel camera, including the quality Carl Zeiss lens with auto-focus, Xenon flash for low-light shooting, adjustable ISO and exposure compensation and other imaging tweaks that are usually only found on dedicated digital cameras. As expected, images from the N82 rival those from an entry-level compact camera, and nightclub shots in particular had a natural, evenly-distributed lighting that eliminated

The N82's 5MP camera features in particular help this model stand out from the crowd.

most of the graininess we're used to on night-time pics.

GPS works with the Nokia Maps application and does a great job at making the most of the small 2.4in screen. But it's still hard to get your bearings at a glance — even with the display set to landscape — so verbal guidance is a must-have. Unfortunately, this isn't included with the phone save for a three-day trial; after that, you can choose from three different payment options: \$10.50 for a week, \$14 for a month, and \$119.75 for a full year. At least you don't have to download maps over the network (which was the case with the N95), as Australia-wide maps are included on the microSD card.

Call quality and reception isn't something we've ever had a problem with on Nokia phones, and thankfully the N82 follows tradition. Battery life is also decent for a smartphone; with half an hour worth of calls and medium usage of Bluetooth, camera and SMS, we were able to go two and a half days before it needed a recharge.

Jenneth Orantia

# Samsung BlackJack II

GPS and Tri-Band 3G — but still no Wi-Fi.

**T**he original BlackJack showed us what a modern, powerful smartphone could look like. With its sleek body, understated black case and excellent keypad, it looked to be the perfect competitor to the mighty BlackBerry.

But it wasn't perfect. By far, its worst problem was its battery life. If you used it lightly, you'd struggle to get through the day, and if you used it a lot, count your blessings if it saw lunchtime.

The sequel is much more attractive than its predecessor and is now competitive with other stylish smartphones. The new version, fittingly called the BlackJack II is currently only available in the USA, but this is definitely a phone we want to make it to our shores.

This new model sadly doesn't get Wi-Fi, but it has picked up built-in GPS for satellite navigation. The

phone has also been upgraded to tri-band 3G, so it will work on almost any UMTS or HSDPA network you can name.

Samsung has replaced the jog wheel with a rotating d-pad, making it easy to scroll through emails, web sites and menus with the flick of a thumb.

The display has grown from 2.3in to 2.4in, at the same 320 x 240 resolution. And it's bordering on the brightness and vividness of the iPhone and iPod touch displays.

The two-megapixel camera is a bit behind other smartphones, with average image quality and no kind of flash. If you've become used to using your phone as your point-and-shoot camera, you'll be disappointed.

However, despite all its good points, it really comes down to whether it can handle a single day of heavy use. The BlackJack II

includes a 1,700mAh battery, which manages to power the phone for a whole day of email, web browsing and phone calls, and still having a sliver of battery life by evening.

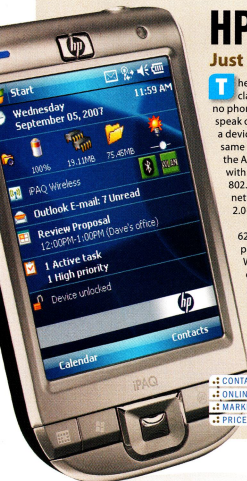
Hopefully the BlackJack II will make it to one of our local carriers, as it is a great little smartphone. Good looks, powerful features and now decent battery life come together in a great tool for the businessperson on-the-go.

*Mitchell Oke*

- CONTACT Samsung
- ONLINE [www.samsungblackjack.com](http://www.samsungblackjack.com)
- MARKET Everyone
- PRICE TBA

- ✓ Stylish; screen; improved battery life.
- ✗ No Wi-Fi; average camera.

**7**  
**10**



# HP iPAQ 112

Just when you thought PDAs had finally been put to rest...

**T**he HP iPAQ 112 is of the classic PDA variety, with no phone functionality to speak of. Instead, you get a device that's roughly the same height and thickness of the Apple iPhone (but wider), with a 3.5in touchscreen, 802.11b/g wireless networking and Bluetooth 2.0+EDR.

Aside from a faster 624MHz Marvell PXA310 processor and the latest Windows Mobile 6 Classic operating system, the iPAQ 112 is essentially identical to previous models available.

HP has added a few of its own utilities and programs to the standard WM6 build,

Including a couple of plug-ins for the Today screen and an enhanced photo management application. Of interest is the BT Phone Manager, which lets you connect the iPAQ 112 to your mobile over Bluetooth to use its data connection, but good luck getting it to work — after several attempts to connect it to a Nokia N82 (which involved changing settings in three different programs), we gave it up as a lost cause.

The unit's 116.7 x 68.9 x 13.6mm dimensions make it a tad large to fit in a pocket, but it has a good-sized screen and a full set of applications for letting you do everything from email and web browsing to listening to music and working on documents and spreadsheets.

Given how cheap flash memory is these days, the 256MB of ROM on the iPAQ 112 is a little bit on the skimpy side we'd have to say, but adding more memory doesn't cost much thanks to the full-sized SDHC slot. It also has a standard 3.5mm headphone jack.

The iPAQ's limited 65K colour range makes video look dim and washed out, and the viewing angles are limited.

The built-in 802.11b/g Wi-Fi lets you use the iPAQ 112 as a portable internet device, but we had difficulty getting it to consistently connect to our WPA2-encrypted 802.11n wireless network in testing.

The lack of innovation in the iPAQ 112 is disappointing. To revive interest in the PDA market, we would've liked to see something new and exciting, instead of a tired refresh of the old design and feature set.

*Jenneth Orantia*

- CONTACT HP
- ONLINE [www.hp.com.au](http://www.hp.com.au)
- MARKET Everyone
- PRICE \$399

- ✓ Speedy performance; compact footprint.
- ✗ Dated; buggy wireless connection.

**6**  
**10**



# Samsung YP-P2

The iPod's not the only MP3 player worth considering.

**T**he P2 resembles a cross between the second-generation iPod nano and the iPod touch. Its slender 100 x 52 x 9.9mm dimensions make it easy to slip into a pocket, and while the 85g weight is a tad heavy it gives the P2 a reassuringly solid feel. Our only complaint on the hardware front is the glossy black finish is especially prone to showing off fingerprints.

Available in 2GB, 4GB and 8GB capacities, the P2 joins a stable of flash-based portable media players jostling for market share, but it's got more than a few tricks up its sleeve to set itself apart. For one, it has a three-inch LCD screen with a generous 480 x 272-pixel resolution and it's also touchscreen-enabled, so menu navigation and media playback are performed by pressing the virtual on-screen buttons.

Extensive Bluetooth support is the P2's most compelling feature,

especially as it's something that other media players have been slow to adopt. Using Bluetooth, you can connect up to two stereo Bluetooth headphones at a time, send and receive media files from other devices, and even use it as a mobile phone hands-free.

Limited codec compatibility is where the P2 loses traction. On the music side, it can only play MP3 and WMA, and photos and videos are limited to JPG, WMV and MPEG-4. One feature it offers is the ability to convert videos to P2-compatible files, but our attempts at doing this for movies and TV shows encoded in xViD were unsuccessful.

Movies that were already loaded on the P2 looked fantastic: bright and vivid colours, smooth playback and excellent contrast. But it's music that really blew us away with clear treble, punchier bass and a rich and full-bodied mid-range that

sounded more like a CD than compressed MP3 tracks. Battery life is decent: playing a looped library of MP3s with the display turned off, we were able to get just over 19 hours of playback.

At \$299 for the 4GB version, the P2 costs a hundred dollars more than the equivalent iPod nano, but the larger screen, Bluetooth functionality and superior audio make the extra money well worth it.

**Jenneth Orantia**

CONTACT	Samsung
ONLINE	<a href="http://www.samsung.com/au">www.samsung.com/au</a>
MARKET	Everyone
PRICE	\$299 (4GB)



- ✓ Fantastic audio; built-in Bluetooth.
- ✗ Limited codecs; buggy desktop software.

**7/10**

# Mio C720t

Value-added navigation means you can get there in style.

**S**itting at the helm of Mio's portable navigation range is the slim-line DigiWalker C720t. Unlike most devices in its class, it has a few unique selling points, not the least of which is native support for live traffic updates over TMC

(Traffic Message Channel). TMC has been supported in other countries for years, but it's only just started being implemented in Australia. Put simply, it's a wireless technology that broadcasts live traffic information over FM radio, and it's used by GPS devices to add an extra layer of intelligence to navigation. Broadcasting is

currently limited to Melbourne. However, Sydney and Brisbane roll-outs are expected by mid-year, with Perth and Adelaide to follow late 2008 to early 2009.

TMC aside, the C720t is well-equipped. It functions mainly as a portable navigation device, but also offers multimedia playback and Bluetooth hands-free, as well as a 2MP camera. The underlying operating system is Windows CE Core 5.0, which Mio's customised with its own interface and apps including Mio Map & MioPlayer Pro.

The C720t is perfectly usable as a portable media player in its own right, with a good-sized 4.3in widescreen display, drag-and-drop file support in Windows and a full 3.5mm audio jack.

On the navigation side, the C720t has a 20-channel SIRStar III

GPS receiver and uses the latest WhereIS R14 maps. Navigating through the menu system is mostly easy thanks to the touchscreen and large finger-friendly buttons, but icons on the main mapping screen are smaller.

Performance on the C720t is excellent, with satellite acquisition and rerouting taking only a couple of seconds. But the tech still isn't fool-proof. As we've found on other nav devices, GPS directions can range from misleading to downright dangerous.

These shortcomings aren't unique to Mio devices, though, and if you're in the market for a navigation device, the C720t is one of the better options available — especially once you add a TMC subscription.

**Jenneth Orantia**

CONTACT	Mio
ONLINE	<a href="http://www.mio-tech.com.au">www.mio-tech.com.au</a>
MARKET	Everyone
PRICE	\$649

- ✓ Live traffic updates; full media player.
- ✗ Can't play music during navigation.

**8/10**





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*Eamon Sullivan*  
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Lenovo Ambassador  
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# Panasonic DMC-FS20

It may look like other models — but there's more than meets the eye with this Panasonic.

Is that 10 megapixels in your pocket or are you just happy to see me?

One of the hardest purchases to make these days must surely be a pocket-sized digital still camera. The fact that manufacturers have mostly standardised on a shape and size means the points of difference of one camera over another has to come down to features, price and functionality.

The Panasonic FS20 enters this market pretty much looking the same as every other camera. In fact, initially we thought it was a Casio, so similar was it to a three-year-old camera! However, the 10-megapixel sensor is a far cry from the 2.2-megapixel Casio, and certainly the Leica lens in the Panasonic is up there with the best. In this area, also of a major nature, is the fact the stabilisation system in the FS20 is optically based and not digital (which is less effective and efficient).

As is now ubiquitous, the majority of the fine tuning controls are menu-based, displaying clearly on the 2.5in TFT LCD monitor. Operation and navigation is

CONTACT	Panasonic Australia
ONLINE	<a href="http://www.panasonic.com.au">www.panasonic.com.au</a>
MARKET	Everyone
PRICE	\$529

✓ Excellent lens and UI for menu functions.

✗ No SD card supplied.

9  
10

processed by a joystick mounted in the right-hand body of the camera, and is easy to figure out even without reading the manual. One touted feature is what Panasonic calls 'Intelligent Auto' that senses the scene and automatically makes its best guess at which settings to use for an optimal picture.

While this is fine — and we have to say it works better than we expected — a 'real' photographer wants access to controls to change aperture, shutter speed, ISO and so on. Using the joystick in each of the four directions gives immediate access to the majority of these settings, making it a doddle to switch between what is essentially a camera acting like a robot, to a camera behaving like an artistic tool.

Another mode, QMENU, with a push of a button brings up a (quick)

menu to change the settings of picture size, ISO, white balance, face detection, burst shooting and stabilisation. In short, this system of function selection is the best and quickest we have seen in a camera of this ilk for quite some time, and the Panasonic engineers are to be applauded for their interface design.

Hardware-based controls include top-mounted on/off, tele/wide and a single button for (ugh) electronic zoom. When will manufacturers learn this is nonsense and seems to be there just so marketing people can say "my number is bigger than yours" in most cases?

On the rear is a single switch to flick between record and playback, change modes, on-screen display options (grid, settings), the aforementioned joystick and QMENU buttons. A flip-out panel

on the right hides USB and AV connections.

At 132g, the FS20 is not going to wear through a jeans pocket and can be whipped out quickly to get that money shot. And it's somehow awe-inspiring that a camera of this physical size can shoot an image suitable for placement in a glossy magazine. The specifications don't state a start-up time, but its quick — < 1 sec I would suggest. The FS20 uses an SD card for storage (not supplied); however, for emergencies a small built-in memory (50MB) can allow you store up to 15 images in full resolution. With the standard battery fitted, approximately 280 images can be taken. We'd get a bigger battery.

For the type of camera this is, it does its job admirably. There is not a lot to set differing manufacturers and models apart; for us, with the Panasonic DMC-FS20, it's the Leica lens coupled with the 10MP sensor. And the low light tolerance is pretty damn good too.

David Hague

# Pentax K20D

## Powerhouse for prosomers.

A sign of a 'competently made and thought out' professional camera is its ease of use. We received the K20D with no manual at all — and it only took minutes to work out the various functions.

The body of the K20D is solid. It's heavier than expected and feels almost bulletproof. But despite the weight, it is comfortable to use for long periods of time in two handed mode with all the external controls easy to reach. Pentax says the extra bulk and weight is due to more effective weather sealing, which for sports photographers is a primary consideration of any camera. On that note however, the K20D's three-frames-per-second shooting may not be enough for some.

The review unit came with an 18-55mm lens and, while adequate for portrait shots and the like, we'd be inclined to go for a

longer lens for day-to-day use.

The biggest obvious change between the K20D and its predecessor the K10D is a rather large jump in megapixel rating — up to 14.6 compared to 10MP. Another massive increase is the change in the ISO rating with a peak of 6,400 compared to 1,600!

The amount of data regarding the settings in the camera that can be displayed on the LCD is staggering: everything you need to know is available in a single window by the press of a button. The most important of these is also duplicated in the top LCD panel and in the viewfinder. An excellent innovation is a digital preview system; here, a preview of the shot is dynamically updated as any parameters are changed in real time.

Finally, another new option is what Pentax calls LiveView —



- CONTACT CR Kennedy
- ONLINE [www.crkenney.com.au](http://www.crkenney.com.au)
- MARKET Prosumer
- PRICE \$1,899 (with 18-55 mm lens)

- ✓ Solid; weatherproofing; digital preview system.
- ✗ LiveView seems superfluous.

**9/10**

although most reviews we have seen seem to think that description is a little optimistic. Essentially LiveView shows focus, white balance and framing — but seemingly nothing else.

Overall, the Pentax K20D is an excellent camera and worthy of its

place in the ranks (at this level of DSLR camera — and price range). Whereas new customers may have wandered automatically over to the Canon or Nikon sales desk, we would urge a detour to the Pentax one and have a play.

David Hague

# Panasonic SDR-H280 Camcorder

## The move from tape to other storage media has led to ever smaller camcorders.

With the SDR-H280, Panasonic has covered its bets somewhat by releasing what is dubbed a 'hybrid', with both SD capability and a 30GB hard drive.

There are pros and cons to this. The tendency with so much space is to shoot more rather than less, and this can lead to a lot of wading

through files. The danger is that sorting the files is more trouble than it's worth so the whole shooting session becomes a non-event. The SD card on the other hand, with current technology, 4GB would be around three hours

or so, approximately the same as three MiniDV tapes and therefore much more manageable.

The mechanism to switch between SD/HDD recording is not as straightforward as it could be, as it is in the on-screen menu and not a physical switch.

The top of the SDR-H280 has only two controls — a Wide-Tele / Volume combo switch and a still image 'shutter release'. All other controls, and the SD card storage area, are exposed by opening the 2.7in LCD flip out.

Sadly, as seems to be the current trend to bring down camera sizes and presumably cost, there is no viewfinder; all framing and composing has to be done via the LCD screen. Thankfully, the LCD can

actually be seen even in bright sunlight. The downside though is that battery life is compromised accordingly by constant use of the LCD. In use, the HDR-280 is quite light and well-balanced. With your hand through the strap, it is almost impossible to rotate the mode selector with that hand, but other rear mounted controls fall comfortably under the right thumb.

But now a major gripe. The USB port is under the battery; in other words, the battery must be removed and the camcorder put onto mains power before being able to download from the HDD to a computer. This is another good reason to shoot to SD cards, as most laptops have an SD port — and a card reader is a cheap accessory for a desktop PC.

David Hague



- CONTACT Panasonic Australia
- ONLINE [www.panasonic.com.au](http://www.panasonic.com.au)
- MARKET Everyone
- PRICE \$1,209

- ✓ Great LCD; excellent lens and images.
- ✗ Poor USB placement; no viewfinder; 2MP stills.

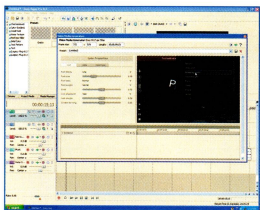
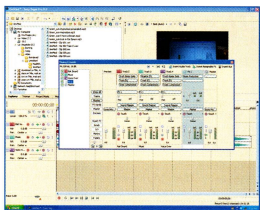
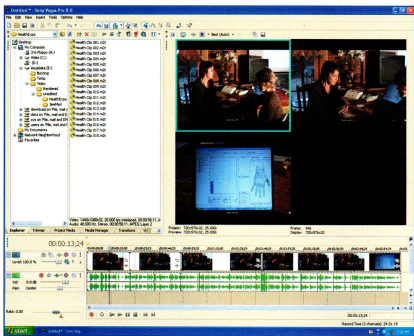
**8/10**





Multi-camera editing simulates a video switcher and allows you to select the most appropriate camera view whilst previewing the video.

The new Mixing Console further enhances Vegas' excellent audio support by providing a mixing desk interface.



# Sony Vegas Pro 8

The latest iteration of this editing package features both pros and cons.

Those who are already familiar with earlier versions of Vegas will have a sense of déjà vu when upgrading to Vegas Pro 8 because most of the enhancements have taken place under the hood rather than with the interface, usability or workflow.

Vegas Pro 8 (along with its DVD burning package DVD Architect 4.5) is now supported under Vista but fails to take advantage of the new GUI possibilities. This isn't a bad thing for those who are used to how Vegas works but it leaves the software looking stuck in the Windows 9x era compared with some of the competing packages that sport slick interfaces.

Vegas was always very good with rendering and applying video effects, however this version is even better thanks to the new 32-bit engine and support for linear light gamma. If you are just doing simple

- **CONTACT** New Magic
- **ONLINE** [www.newmagic.com.au](http://www.newmagic.com.au)
- **MARKET** Everyone
- **PRICE** \$749 or \$395 upgrade

cuts, wipes and supers (tinting) you probably won't notice that much difference; however, if you are applying some of Vegas's film-like effects such as diffusion (putting a glow around objects) or complex compositing (multiple effects), you may find Vegas acts more optically correct giving better colour definition.

Whilst it was possible to do multi-camera editing in earlier versions of Vegas, this involved purchasing third party software plug-ins. Now with multi-camera editing built into the software, it is a simple matter of loading video tracks, synchronising them and then selecting the appropriate camera when viewing the video on

- ✓ **ProType Titler:** Vista support.
- ✗ **Fails to take advantage** of new Vista GUI.

a monitor or in the preview window. Multi-camera edits can also be reviewed on the timeline if you prefer the more traditional Vegas way of working.

Vegas has always had outstanding audio support (in fact it started out life as a multi-track audio mixing package) which has been further enhanced with the new mixing console window. This looks and behaves like a typical studio mixer with individual controls, assignable buses and the ability to clearly see what effects have been applied to each track.

One of the criticisms of earlier versions was its limited titling. This has finally been addressed with the new ProType titler module. At last

The new ProType titling module allows you to go crazy with a myriad of titling and super effects.



Vegas users can create complex titles with the ability to track curves, fly in, bounce or do one of the other crazy preset or user customisable effects. Also enhanced is the help system with new, interactive tutorials to assist you to perform routine tasks such as importing video, using audio plug-ins and carry out editing tasks. Unlike a movie or wizard, the interactive tutorial helps you to learn by doing rather than watching or letting the software do all of the work.

If you have outgrown your typical consumer editing package, Vegas Pro 8 is definitely worth considering. Although there is probably not enough to encourage seasoned editors to move from Avid or other heavy-duty professional tools, there are enough enhancements to entice earlier Vegas users to upgrade.

David Neiger



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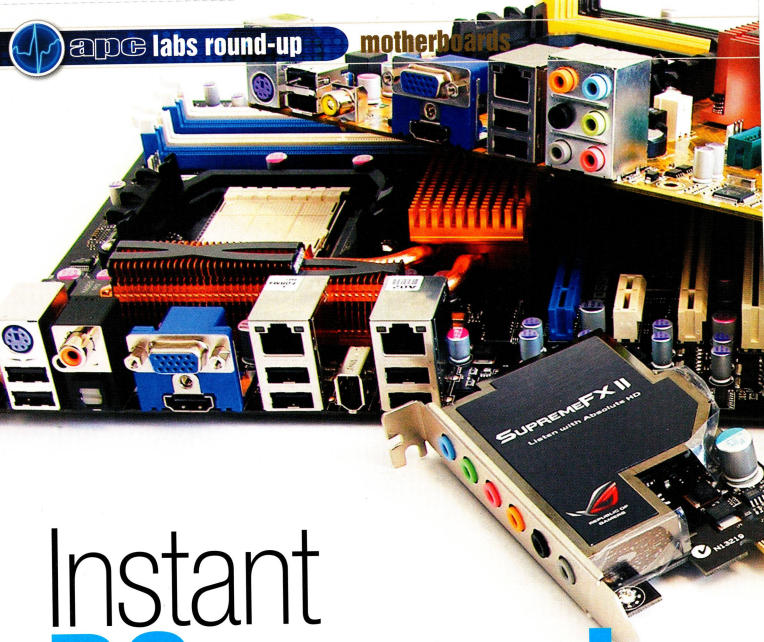
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# Instant PC upgrades

Transform your PC with a motherboard upgrade for every budget.

**T**here is no better way to dramatically upgrade your PC than to install a new motherboard. Over the past few months, motherboards have again taken a leap forward in performance thanks to newly released Intel and Nvidia chipsets for Intel processors and a new top-of-the-range chipset from Nvidia supporting AMD Phenom processors. We've chosen the motherboards that represent the

best choice at each price point when looking to upgrade your PC. Boards as cheap as MSI's S80 K9A2GM, as good value as Gigabyte's GA-EP35-DS3P, and as hardcore as ASUS's Striker II Extreme Formula.

These new-generation boards tend to include features not seen before at their different price points, from onboard HDMI to integrated power/CMOS and reset switches, open and flexible BIOS options for

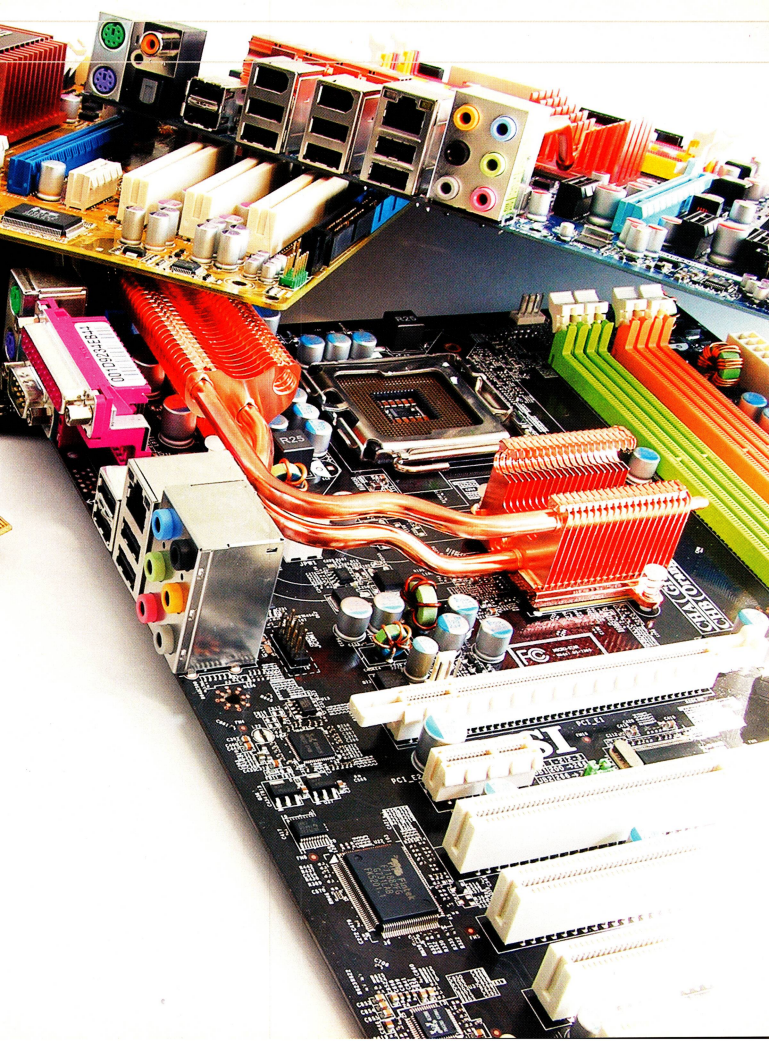
overclocking and a swathe of cooling components to ensure stability even when pushing the hardware to its limits.

The Gigabyte board's Intel P35 chipset may not be an enthusiast chipset any more, but we're seeing a new type of functionality brought to the forefront for the sake of energy savings. As you'll see, it certainly didn't hurt performance either.

Along with the P35, we have

boards sporting the Intel X48 enthusiast chipset, Nvidia 790i and Nvidia 790a MCPs. As a whole, the boards use DDR2 memory; we picked boards still using the 'old' type of RAM on purpose. Considering the slight performance lags over DDR3 and the huge price differential, we still think it's a wise buy to stick with DDR2 for the time being. In a few months, though, who knows?





**BUDGET (BUT GOOD)****\$90**

# MSI K9A2GM

**Less than \$100, but the perfect basis for a home-theatre PC.**

**I**n this day and age of gold-plated motherboards emblazoned with diamond-encrusted heatsinks, it's refreshing to get our hands on a simple motherboard. The K9A2GM doesn't have more USB ports than you can count or dozens of voltage tweaking options. What it does have is a ticket price of less than a hundred bucks and it has a very cool feature that is missing from boards that are twice its price.

It has an integrated HDMI port, and, when combined with this board's small form factor and passive cooling, this makes it the perfect basis for a home-theatre PC. The integrated Realtek ALC888 audio could be a weak point, though, as it doesn't support optical out, so you'll need to squeeze in a sound card.

If you want to stream your flicks off hard drives, the ability to RAID up your SATA drives via the four SATA ports is a welcome inclusion, and the GbLAN will make short work of your streaming needs. Being based on the AMD 780G chipset, it's a decent overclocker, but to focus on

• **CONTACT** MSI  
 • **ONLINE** [www.msicomputer.com.au](http://www.msicomputer.com.au)  
 • **MARKET** Everyone  
 • **PRICE** \$90

this is missing the point — our meagre 10% overclock proves that tweekers should probably be looking elsewhere.

It's also not the most well-connected board available, with only one PCI-E 16x slot, one PCI-E 1x and two PCI slots, but for an HTPC builder this won't be a concern. As far as we can tell, this motherboard uses the integrated Radeon HD 3200 graphics chipset, which redefines integrated graphics performance. While it won't be putting your 8800GTX to shame anytime soon, it's got more than enough oomph to chew through your Blu-ray flicks without breaking a sweat. Once again, it

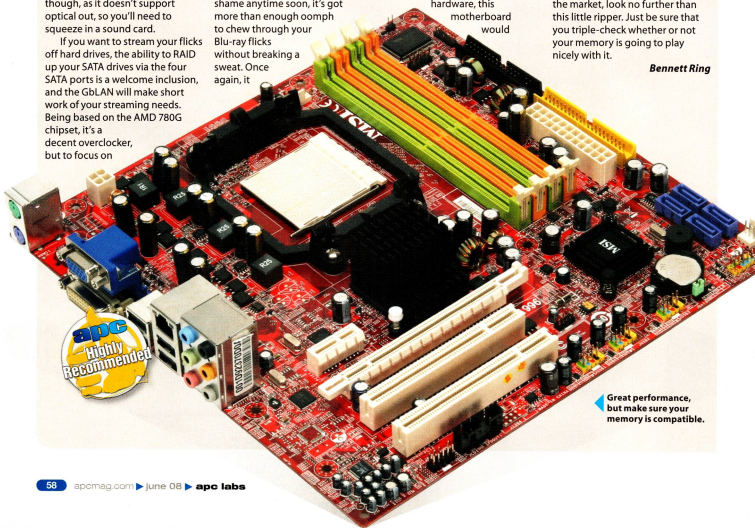
✓ Price: great for a HTPC setup.

✗ Very average overclocking results.

**8/10**

not boot with the RAM installed in a dual channel configuration. The only way we could test it was to have both RAM sticks in the DIMM 3 and 4 slots, halving our theoretical memory bandwidth. Having said that, once it was up and running, it didn't crash once during a few hours of solid benchmarking, which is more than can be said about some of the higher models.

If you're looking for a board to run Crysis at high-res while overclocking your AMD CPU to near-light speed, look elsewhere. However, if you want a cheap and silent motherboard that just happens to have one of the best integrated graphics chipsets on the market, look no further than this little ripper. Just be sure that you triple-check whether or not your memory is going to play nicely with it.

*Bennett Ring*

Great performance, but make sure your memory is compatible.



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tech... today!

**ALL-ROUNDER \$229**

# Gigabyte GA-EP35-DS3P

Great affordable board with the features of previous-gen premium boards.

It wasn't too long ago that a motherboard with dual graphics-capable PCI-E slots would be considered the Ferrari of the motherboard world. Throw in extensive overclocking options, high-end integrated audio and an exotic heat-pipe cooling system, and enthusiasts would have been happy to forego a week's salary for a board incorporating all of these features. How things change. Fast forward to today, and Gigabyte's GA-EP35-DS3P is a fine example of how yesterday's cutting edge technology rapidly becomes today's entry level.

When we first heard that this board retailed for around two hundred dollars, we were sure the over-enthusiastic supplier had made a typo in their email. Considering how feature-packed this board is, we were expecting a price over the four hundred dollar range. But no, somehow Gigabyte has managed to cram in a whole lot of goodness for a price that won't break the bank.

Two main PCI-E slots—one running at 16x, the other at 4x—imply dual video card support, but don't be fooled; until Nvidia

CONTACT Gigabyte  
ONLINE [www.gigabyte.com.tw](http://www.gigabyte.com.tw)  
MARKET Everyone  
PRICE \$229

allows other chipset manufacturers to run SLI, the P35 chipset that this board utilizes is strictly a single-Nvidia card or CrossFire multi-card solution.

As well as these full-sized PCI slots, another three PCI-E x1 slots are provided, while a further two PCI will offer any ageing components that you're not ready to retire. Six SATA connectors are ready for your RAID array, supporting a wide range of SATA formats (SATAII0, SATAII1, SATAII2, SATAII3, SATAII4, SATAIIS, ATA RAID 0, RAID 1, RAID 5, and RAID 10).

If you don't mind voiding your CPU's warranty, the GA-EP35-DS3P is more than willing to push your silicon to the limit. We were most impressed by its out-of-the-box support for DDR2 running at 1,200MHz, and Gigabyte claims a 1,600MHz front-side bus isn't out of the question. Our overclocking tests show that 400MHz is easy, with our test sample hitting 440MHz, giving our E8500 CPU

- ✓ Energy saving; good overclocking.
- ✗ SLI is on the wish list, hopefully it arrives.

**8/10**

a final speed of 4,180MHz. We're pretty sure that the limiting factor in our overclock was the CPU, not the board.

If you don't particularly enjoy the wasp-like sound of fans buzzing in your case, the passive heatsinks will keep your ear drums happy, allowing them to enjoy the Realtek ALC889A integrated audio. This audio solution won't rival a standalone X-Fi solution, but it's certainly a lot easier to set up.

This is the first board through the Labs that uses Gigabyte's new DES (or Dynamic Energy Saver) technology. Using the included software, the board detects the CPU's current load and, should it be just idling along, turns off unneeded power channels, reducing overall power consumption.

Setting up this board couldn't have been simpler and was a most welcome relief compared to a batch of other boards we've tested recently. It worked just as it was

supposed to—plug everything in, switch it on and away you go.

The BIOS is one of the best we've seen, for two reasons. Firstly, it offers a massive range of tweaking options, allowing the user to wring the most out of their hardware. But most importantly, it provides a detailed description of each setting, along with its default value, making it hard to mess things up. Performance was equally admirable, doing very well across our Cinebench, PCMark Vantage and SiSoft Sandra benchmarks.

The only thing missing from this motherboard is SLI support. The hardware appears to be ready; now it's just a matter of time before Nvidia and Intel strike up a deal to share the technology. Failing that, we hope that Intel can figure out a way to offer dual-card support that is provider-agnostic, enabling enthusiast performance on its platform for both ATI and Nvidia fans.

But we're guessing that we'll probably see world peace and an end to global warming before that day ever arrives.

**Bennett Ring**





HIGH PERFORMANCE \$399



# DFI X48 LANParty UT

**A rocket powered by Intel's latest and fastest chipset.**

**D**FI isn't as large as motherboard manufacturers like ASUS and Gigabyte, but its followers would have to be some of the most loyal. Only a few years ago when AMD ruled supreme in the enthusiast CPU world, the nForce-based Socket 939 boards were the ones to own. While DFI's transition into performance Intel boards was a slow one, the P35 chipset saw the introduction of the much-loved LANParty series once again.

Fast forward a little more and we have with us the latest Intel chipset, the X48 sitting under the LANParty UT name from DFI. The first thing that's worth noting is that the X48 motherboard isn't restricted to DDR3 memory like a lot of people thought it was going to be. While some companies offer both DDR2 and DDR3 versions, at the moment DFI only has a DDR2 variation on offer, which makes getting into performance computing a good chunk cheaper.

Out of the box we've got four DDR2 DIMM slots offering support for up to 8GB of memory at 800MHz, two PCI Express 16x slots that offer full support for AMD's CrossFire technology, a single PCI-E 1x and 4x slot along with three standard legacy PCI slots which continue to be handy.

Sound comes in the form of the Bernstein audio module using the Realtek ALC885 8 Channel High Definition Audio chip. Sound quality out of the little module isn't too bad. Onboard sound has really come a long way from a few years ago, though any die hard audio lover will most likely find themselves

buying something based on the X-Fi chip.

Two Marvell Gigabit controllers are located on board, giving us Dual Gigabit networking along with a VIA VT6307 chip offering two FireWire 400 ports. The latest ICH9R Southbridge helps take care of most of our storage duties, giving us six SATA ports distributed RAID 0, 1, 0+1 and 5. We also have a JMicron controller that gives us a further two SATA ports, taking the ports up to a grand total of eight along with a single IDE port as well.

DFI has used a green and yellow colour scheme, and the general layout of components seems to be good. With longer graphics cards like the 9800GX2 installed, we didn't run into issues like losing SATA ports or any other connectors.

Out of the box there is no

Northbridge cooler installed, and you will have to venture into the bundle to find this. DFI has a massive heatsink designed and tested by Thermalright which is installed by using a simple push pin method. Also included in the bundle is some high-quality Shin-Etsu thermal paste that needs to be applied before installing the heatsink DFI has dubbed the 'Minator'.

Performance out of the box is as you would expect from a board of this calibre; it's slightly above the X38-based motherboards and pretty much on par with any other DDR2-based X48 one. Where the DFI really manages to shine however is in the overclocking department; at stock CPU volts we find ourselves climbing from the stock 2.4GHz clock on the Q6600 to

3.6GHz. Moving the vcore voltage on the CPU to 1.45v and achieving a solid 3.9GHz was accomplished.

The DFI LANParty series of motherboards continue to be at the top when it comes to performance. Furthermore, installation is a breeze and you will find yourself installing your CPU to be up and running in next to no time, which is more than can be said for most boards of yesteryear. DFI created a bit of a name for itself as a board that wasn't user-friendly, but if you're looking for a board that is going to run your gear at stock speeds it's a great option. The added advantage is that if you do decide to get a bit dirty later down the track, you have all the options there along with a wealth of information on the internet to keep you on the right track.

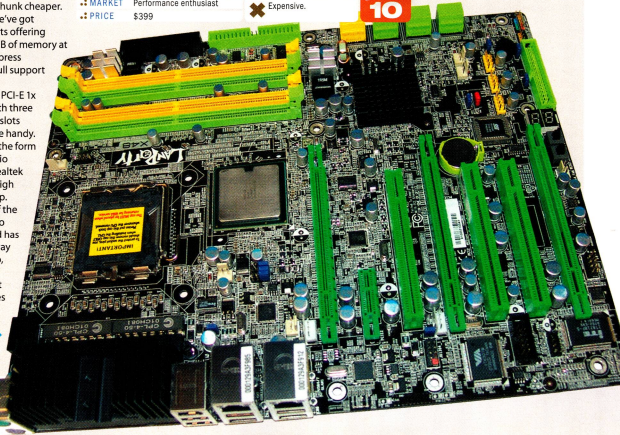
**Shane Baxtor**

- **CONTACT** [Bronet](#)
- **ONLINE** [www.bronet.com.au](#)
- **MARKET** Performance enthusiast
- **PRICE** \$399

- ✓ Performance; overclock ability; cooling.
- ✗ Expensive.

**9**  
**10**

The X48: shines in the overclocking department.



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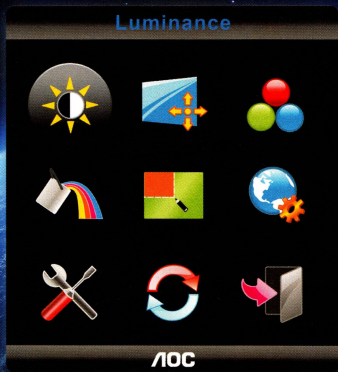


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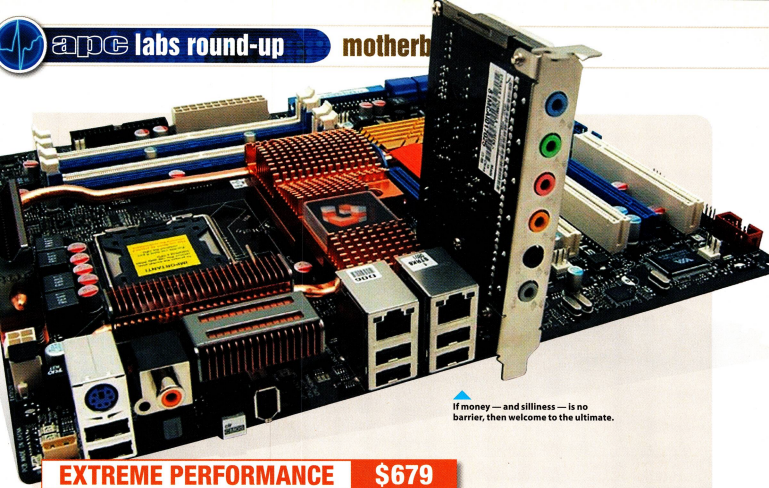
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**EXTREME PERFORMANCE \$679**

# ASUS Striker II Extreme

Targeted at gamers, it's the best of the best.

**G**amers are a discerning bunch when it comes to hardware. Try to bamboozle them with marketing speak and they'll shoot down PR fluff with as little effort as it takes them to execute a rocket jump in Team Fortress 2. So when ASUS targeted gamers with its latest motherboard, the Striker II Extreme, it had to make sure that it was the best of the best, with every feature including the kitchen sink. It seems they delivered, and it even has a few bits and pieces that you would find in the kitchen sink.

We're of course referring to the plumbing that helps to keep the Nvidia 790i chipset, nice and cool. Mounted on top of the SPP is a 'Fusion'-branded waterblock, begging to be plugged into your existing water cooling system. The rest of the board is festooned in enough copper and aluminium to keep a metalsmith busy for a week, but it's there for a good reason. You won't spot a single fan on this board, with it instead

- CONTACT ASUS
- ONLINE [www.asus.com.au](http://www.asus.com.au)
- MARKET Performance enthusiasts
- PRICE \$679

relying upon passive cooling. This makes it great for those who value quiet computing but don't want to sacrifice performance. It will give you a chance to appreciate the board's integrated Azalia HD audio chipset, which is the current ruler of the audio roost.

The hardware has been built with a tinkerer's interests at heart, as evidenced by the very cool LEDs on one of the coolers. These change colours depending on how much voltage certain components are pulling — if you start seeing red it's time to ease back or risk the sweet smell of melting hardware.

As expected for such a high-end motherboard based on Nvidia's flagship motherboard chipset, SLI support is included. Instead of the old dual-SLI setup though, this board now supports

✓ Memory bandwidth; fine overlocking control.

✗ Very expensive.

**7/10**

three-way SLI. However, we find it hard to recommend this hardware configuration, as today's CPUs are definitely the weak point in this setup, and there's still lots of teething problems with game compatibility.

Six SATA ports offer the full gamut of SATA and RAID types, while ten USB ports should be more than enough for all but the heaviest peripheral user. Tweaking options in the BIOS are extensive, as expected given this board's target audience, and we especially like the massive range of voltage tweaks, with around eight or nine various voltage tweaks.

Due to the fact that the board is festooned with a small mine's worth of metal, installing our over-sized Ninja HSF was a bit of a tight squeeze. Setup ran without a hitch though, and we're happy to report

that we didn't get a single crash during our testing.

Considering we were expecting great things out of this board, we were a little surprised that the performance wasn't quite the revolution we'd anticipated. It seems the use of DDR3 memory and the 790i chipset only offers around 10 to 15% performance increase over the Intel P35 with DDR2 combination.

Which conveniently brings us to the issue of this board's price. Sit down before you read on, OK, ready? Take the figure of three hundred dollars... and double it. That's right, you're going to have to pay over six hundred dollars to be on the bleeding edge of technology. You can almost build an entire budget PC for the same cost, although it'll probably only be as powerful as this motherboard's onboard audio. If money is no object, it's hard to go past this board, but for the rest of us, it's all just a bit silly.

**Bennett Ring**



Solid build all-round, but the Phenom will drag the chain...

**AMD ALL-ROUNDER**

**\$389**

# MSI K9N2 Diamond

**A solid board for AMD, slowed only by the Phenom CPU.**

**A**s fans of close competition in the hardware world, it pains us to say that AMD's Phenom really hasn't tickled our fancy. Compared to the magical 45-nanometre chips Intel is now pumping out, the Phenom seems overpriced and underperforming. But some folks still insist on wearing an Intel Outside badge, sticking to their beloved AMD brand, and it's these folks that the MSI K9N2 Diamond is aimed squarely at. But can the shiny goodies of this high-end gem counter the lump of coal that resides within the CPU socket?

Thanks to the powerful Nvidia 780a chipset used by this board, it's another tri-SLI contender. And like the other tri-SLI boards on the market, we think you'd have to be absolutely insane to stick three high-end GeForce cards in this board — the minimal performance gain under normal gaming circumstances simply isn't worth the money or effort involved in having a tri-SLI system.

What we do like about this

• **CONTACT** MSI  
 • **ONLINE** [www.msicomputer.com.au](http://www.msicomputer.com.au)  
 • **MARKET** Performance enthusiast  
 • **PRICE** \$389

chipset is its blisteringly fast memory performance, which benchmarked in SiSoft Sandra at around 50% faster than similarly priced Intel systems. Sadly, in real-world tests which focused on single-thread performance, the entire system is let down by the lacklustre performance of the Phenom CPU.

A nice touch in this kit is the inclusion of an MSI-branded X-Fi Xtreme Audio sound card. This says one of two things to us; either MSI is a big fan of X-Fi sound, or Creative is unloading its remaining chips since it bungled up (and continues to ruin) its rollout of Vista drivers. Either way, if you can get it working properly, this is a nice sound card to have. But it's a big if.

Like most high-end boards, ten USB ports provide plenty of connectivity, while the six SATA

✓ Overclocking options;  
X-Fi sound card.

✗ Automatic overclocking  
less than appealing.

**6  
10**

slots support all of the respected SATA modes. Passive cooling is the norm, with nary a fan in sight, although MSI does include one in the box if you'd like to give the cooling a shot in the arm when it comes time to overclock.

But once again, the Phenom proves to be the Achilles heel, as it's not the most overclockable architecture around. Our Phenom only managed a meagre 120MHz over stock speed before it wouldn't boot, equating to a piddly 30MHz overclock of this board's front-side bus. Speaking of overclocking, like every other board on the market, the Diamond includes 'Automatic Overclocking Features'. And just like every other board on the market, this actually means 'The Quickest Way to Have a PC That Won't Boot and Needs a CMOS Reset'.

And like all of the Phenom boards we've tested recently, installation and setup of this board wasn't as trouble-free as our lazy lifestyles demand. It took much experimentation with the RAM configuration before it would boot, but thankfully once we'd found the sweet spot it seemed to be very stable.

We can't blame MSI for the lacklustre experience that is the K9N2 Diamond. The company has done all that it can to provide excellent overclocking options, a great add-in sound card, a passive cooling system that works and a wide range of tweaking options in the BIOS. When the motherboard's subsystems are focused on in benchmarks, they all have excellent performance. No, the problem here lies squarely with the Phenom chip that it will probably end up housing, and with no high clockspeeds in sight, the situation doesn't look set to improve any time soon.

**Bennett Ring**



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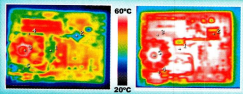


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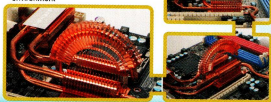
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## AMD PERFORMANCE \$439

## ASUS Crosshair II Extreme

High performance for AMD tragnics.

**A**s part of its Republic Of Gamers marketing brand, you can be sure of one thing about ASUS's latest high-end AMD board — it's going to cost about as much as the GDP of Tasmania. Unlike the extreme gamers we know, who generally fall into the unemployed, full-time student demographic, the 'special' folks who inhabit the Republic Of Gamers sleep on beds of freshly pressed hundred dollar bills and bathe in yak's milk. That's right, they're rich and stupid — well, they'd have to be if they bought this board. Not through any fault of the board, mind you — the problem with the Crosshair II Formula is out of ASUS's hands.

But before we go into the reason why you're better recommending this board to any annoying rich people you know rather than buy it yourself, let's take a look at what we like about this motherboard. And there's certainly a lot to like, with its encyclopaedic

• **CONTACT** ASUS  
• **ONLINE** [www.asus.com.au](http://www.asus.com.au)  
• **MARKET** Performance enthusiast  
• **PRICE** \$439

list of features going some way to justify a price tag around the four hundred and fifty dollar mark.

Three-way SLI is included, although there's no way that three graphics cards are going to be fed anywhere near as much data they'd like, due to the... oops, almost let slip with our big conclusion about why not to buy this board. Dual SLI is fine for us mere mortals, but the hybrid SLI is a nice touch. Thanks to the board's integrated video, even when you've only got one standalone video card installed, it can still leverage both GPUs to provide a performance boost. And when you're not gaming, it'll power down your main card, putting its noisy fan to sleep as the passively cooled integrated graphics kick in.

An Audio riser card is included, which offers sound quality

✓ Great features list: hybrid SLI saves power.

✗ Underwhelming performance results.

**6**  
**10**

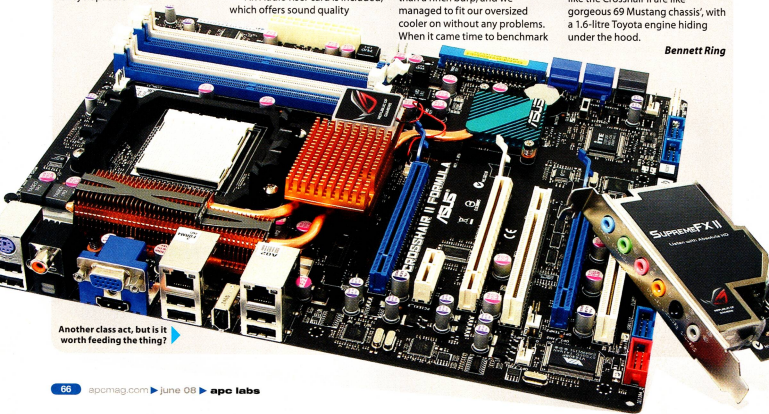
superior to most onboard audio chipsets but still can't rival X-Fi powered beasts (well, when these sound cards actually work). As we saw with its Intel-powered sibling, the Striker II, tweakable will have a field day with this motherboard. There isn't a single tweaking BIOS option that we desire that wasn't included, with a range of voltage options that would put your local power plant to shame. You can even see rough voltage ranges just by glancing at the motherboard, where different LED colours light up to represent different load.

Setting up the Crosshair II Formula couldn't have been simpler, bar one minor hiccup with the driver installation. Thanks to the passive cooling, it's quieter than a finch burp, and we managed to fit our oversized cooler on without any problems. When it came time to benchmark

though, we were saddened by its results. That's right, truly saddened. A board of this pedigree and attention to detail deserves to have blazingly fast benchmark scores, but even when we wrung a meagre 10% overclock out of it, performance was still yawn-inducing — which leads us to our major issue with this board...

The problem all comes down to that little CPU socket. It can only run AMD chips. And if you're spending this much on a board, you probably want to match it up with the fastest CPU on the block. You probably also want to make your incredibly fast chip run just that little bit sillier with the help of overclocking. Sadly, that rules out any existing AMD chips. Gamers know it, we know it, and even die-hard AMD fans know it — right now, Intel's chips are the only serious option for those with the big bucks. Until AMD can get its high-end back into shape, boards like the Crosshair II are like gorgeous 69 Mustang chassis', with a 1.6-litre Toyota engine hiding under the hood.

Bennett Ring



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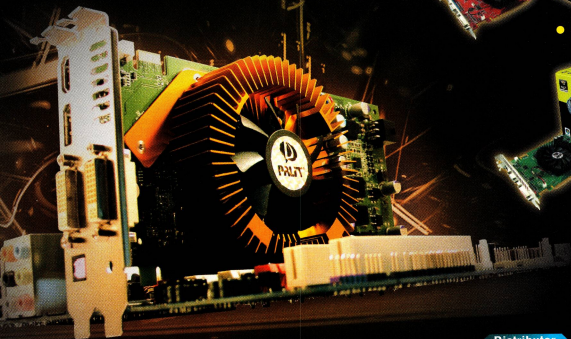
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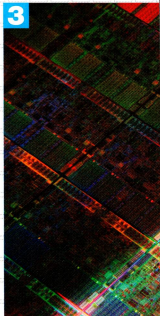
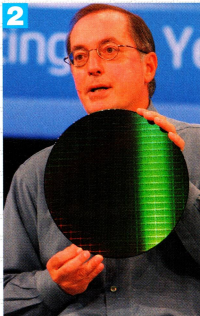
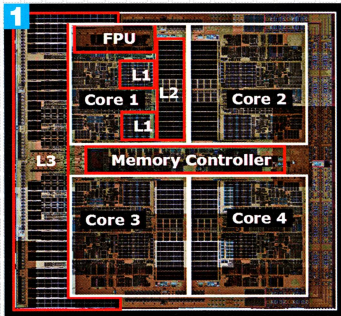
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# Core Wars

First it was speed. Now it's the number of cores.  
David Flynn surveys the latest CPU battleground.

**Y**ou survived the contest for ever-faster processors known as the megahertz wars. Now brace yourself for a new battleground in which cores are the weapon of choice. How many cores? As it is with angels, as many as can be squeezed onto the head of a pin. Dual-core is now the norm and quad-core the cutting edge, but within a year we'll see four-cylinder chips move into the mainstream while eight-core superslabs stake out the server rooms.

Ironically their clock speeds will soar past 3GHz, which is the point where AMD and Intel's megahertz arms race hit the wall. Whereas AMD and Intel once relied on raw clock speed to win bragging rights, each step beyond 3GHz led to dramatically disproportionate rises in power consumption of the single-core processors of the day.

It was the combination of power-efficient chip design (made necessary by the rise of mobile computing) and the realisation that two processor cores could be coupled together to boost performance but reduce overall power load that closed the door on the single-core era and made multi-core the new religion. But AMD and Intel believe there'll be more to this new wave of computing than cores alone.

"Cores can become like frequency was, in terms of being an easy selling point," says Chris Winiewicz, business development manager for AMD. "Just like frequency wasn't everything that a consumer needed, more cores isn't everything that a consumer needs. If performance is what the consumer needs, maybe it's with three cores running at higher

frequency as opposed to six lower clocked cores."

"Cores are just one dynamic," agrees Graham Tucker, technical manager at Intel Australia. "It's not just about throwing more cores on a die, but how you utilise them. If you have them all running flat out the thermals will be shocking. So in the future you'll see more smartness in managing those cores."

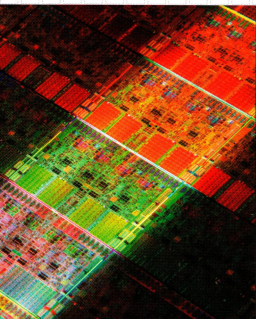
Intel will have plenty to manage when its new microarchitecture arrives at the end of this year. Codenamed Nehalem but tipped to be branded Core 3 (as the successor to today's Core 2 family of processors), it will be the blueprint for almost all Intel-based computers — desktops, notebooks and servers — from 2008 until at least 2010.

Those systems will be powered

by anywhere from two to eight cores on a single processor, compared to Intel's current quad-core solution of strapping two dual-cores chips together, while each individual core will be able to run two simultaneous threads. A quad-core desktop chip will bust out in early 2009 with dual-core desktop and mobile processors plus a quad-core 'extreme mobile' chip before mid-year.

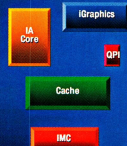
Nehalem is also a "scalable design," explains Intel vice-president Stephen Smith. "It uses a number of building blocks that allows us to build different product configurations, so we can compose various products out of these blocks. Four-core is the first to go into production; we also expect to build a monolithic eight-core design in 2009 with additional bandwidth." Just don't go looking





## 4 Nehalem Design Scalable Via Modularity

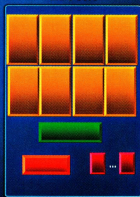
### Nehalem Building Block Library



### Ex: 4 Core



### Ex: 8 Core



Sample Range of Product Options

- 1 Is this AMD's Barcelona or Intel's Nehalem? The quad-core array, integrated memory controller and shared Level 3 cache are common to both systems.
- 2 Intel CEO Paul Otellini holds a prototype Nehalem wafer containing more cores than you could count on your fingers and toes.
- 3 A close-up view of the 45nm Nehalem die.
- 4 Intel's next-gen Nehalem architecture treats cores as just one building block in creating a processor.



IT'S NOT JUST ABOUT THROWING MORE CORES  
ON A DIE, BUT HOW YOU UTILISE THEM  
*INTEL'S GRAHAM TUCKER*

for a single-core Nehalem chip: that's now ancient history, says Smith. "The lowest implementation we have in mind is a two-core design".

In order to keep up with the increased processing power of a multi-core design, the plumbing supporting those cores is also changing. Nehalem will introduce an integrated memory controller, a dedicated CPU pipeline called QuickPath Interconnect and a fat Level 3 cache shared by all cores, starting at 4MB for dual-core chips and 8MB for quad-cores. These of which are catch-ups to technology which AMD has employed for years (for QuickPath Interconnect, read AMD's HyperTransport).

But more cores isn't always the answer, especially for games which are predominately single-threaded applications and unable to use two

cores simultaneously. "There's still a lot of work to be done to develop games which are multithreaded, although that's starting to happen," says Intel's Graham Tucker.

Today's Penryn-class dual-core processors already support a 'turbo mode' for single-threaded software in which one core drops to a low-power idle mode while the second shifts into overdrive by boosting its frequency one increment on the Intel ladder. The total power output remains within the thermal envelope of the dual-core design, so there are no issues with overheating.

"If a customer buys a 2.6GHz dual-core processor he's going to get 2.8GHz when playing single-threaded games," Tucker explains. "This whole concept has room to grow when you go to four or eight cores." Nehalem's processors will

jump up to four stages past the chip's rated speed, so a 2GHz processor will be able to step from 2.2GHz to a ceiling of 2.8GHz. Tucker says that the single-core clock speed will be "dynamically managed depending on workload, and there's a rotation policy to distribute the load around the die so you don't have one area of the die always doing all the work."

While AMD has yet to shift to 45nm and DDR3, the company has already released a triple-core 2.3GHz Phenom X3 processor built on its Barcelona architecture, with Dell and HP among its first customers. Simon Solotko, AMD's desktop brand manager, says that the X3 will "compete extremely well against (current) dual-core products".

"A lot of the performance benefits associated with quad-core,

we're going to see with triple-core, (in particular) for users who are performance-hungry but budget-conscious. They could say, 'Look, I get a huge amount of the performance benefits of basically step up from dual-core, but at the same time I'm getting it at a better price and it's going to be the right combination of price and performance for me.'"

Further down the track is AMD's Fusion project, which also embraces a modular approach to CPU design but could permit the cores themselves to be customised for a specific purpose. "We'll work with our OEMs to bring out the right product for a market need," explains Winiewicz. "Now this is theoretical future stuff, but it's the stuff that we're thinking about. It could be one physics core and two graphics cores all on the same chip." [GTC](#)



## OKI

**C8600**26ppm (A4) colour A3 LED printer  
From \$3,245**C9650**36ppm (A4) colour A3 LED printer  
From \$6,598.90**C3530MFP**16ppm colour A4 LED MFD  
From \$1,639

## HP

**LASERJET 4730**Up to 30ppm A4 colour laser MFD  
From \$8,149

# Business colour

**Stephen Withers looks at the state of play in the world of colour business printing and explains the purchasing factors you should take into consideration.**

**N**ot so long ago, colour printing was generally considered too expensive for everyday business use and was reserved for special jobs. But, lately, the capital and ongoing costs have fallen to a level that allows more frequent use of colour. What's more, good-quality colour brochures and other items can be printed in-house as needed, rather than relying on outside printing services. At the same time, managed printing services that were once aimed mainly at large corporate customers have spread down to medium and in some cases even small businesses, freeing them from many of the issues surrounding the operation of a printer fleet.

## CHOOSING

An early decision that has to be made concerns the number of printers an organisation needs. Do you have one or two high-performing devices to serve the entire building, one printer for each user, or somewhere in between?

Colour laser printers are available for as little as a few hundred dollars, but those models are probably best left to the SOHO market or for

executives and other staff that really do need a personal printer for producing low volumes of confidential material that shouldn't be output on a shared printer. While some workgroup printers can hold a job until the user enters a PIN on the front panel, that may be considered inferior to printing behind a closed door. It may also introduce a security risk unless the job is correctly and fully erased from the printer's hard drive after it is output.

Graham Harman, general manager at OKI, suggests most SMBs would be better off with fewer, faster printers, as long as users don't have to walk too far to collect their output. But he concedes there is room for the personal printer, even when the shared model supports PIN-protected printing.

Fuji Xerox's marketing manager Tom Lewis says there's a tendency to augment a central MFD (often A3) with a number of distributed A4 models, while HP's balanced deployment strategy (getting the right mix of MFDs and printers) "can reduce capital and supplies costs as much as 30 per cent" at the same time as improving printing

performance and user productivity, according to Irma Van Leeuwen, market development manager for MFPs at HP South Pacific.

Factors to consider include the number of users, and the mix of print jobs — someone who only needs to print a short letter or spreadsheet won't want to be forced to wait behind a colleague printing several copies of a complex 50-page colour document.

Opinions are divided about the suitability of inkjets for general business use. While OKI's Harman says "to buy an inkjet [for a business] would be foolish", Epson marketing communications director Mike Pleasants says inkjets can already match lasers for speed, and by the end of the year running costs will be comparable or even cheaper. "All inkjet vendors are looking at ways of [reducing] the cost per page," he says, and suggests that one printer per desk will be affordable before the year is out.

Speed improvements have been achieved through techniques such as using a double black print head, while a whole range of methods are being applied to reduce ink wastage

through head design, better software, more efficient cleaning cycles and so on.

HP's scalable printing technology "by far delivers the lowest cost of ownership and the world's fastest print speeds for small to mid-sized businesses," says Van Leeuwen. It employs a printhead that can deposit a wider than usual band of ink via over 1,000 nozzles for black ink plus a similar number for colour, while its stationary ink cartridges allow the head to move more quickly.

But it's not only inkjet technology that's improving. HP's latest ColorSphere toners optimise the particle size for smooth flow onto the page. "You will notice the difference in text and image sharpness and clarity, gloss, colour intensity and photo resolution," says Van Leeuwen. "Overall outcome... is 39 per cent wider colour gamut, 117 per cent more gloss and consistent quality to the last page."

Similarly, Fuji Xerox's EA-HG toner features finer particles for more even colour, and the company claims CO2 emissions during manufacture have been reduced by 35 per cent.

## HP



### LASERJET CM6040

Up to 40ppm (A4) A3 laser MFD  
**\$15,999**

## EPSON



### STYLUS CX9300F

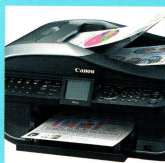
Up to 32ppm (draft) colour A4 MFD  
**\$229**



### STYLUS C110

Up to 37ppm colour A4 inkjet  
**\$149**

## CANON



### PIXMA MX850

Up to 24ppm colour A4 inkjet MFD  
**\$449**

# ur printing

Harman says the "dramatically superior colour" delivered by Oki's LED printers combined with their ability to print on a wide range of media thanks to the straight paper path makes them ideal for in-house colour printing for SMBs. One warning he does give is that you should always test the quality of any printer you're considering by printing on the actual media you plan to use.

Depending on the tasks you've got in mind, it may be worth checking how versatile a printer is in terms of media handling. Printing brochures on heavyweight A4 paper is one thing, but Oki is particularly proud of what its printers can offer SMBs in the way of business cards (without perforated edges), table tents (useful in a wide range of situations) and other specialised items as well.

When it comes to printing on media other than regular office paper, there's one area where inkjets still reign supreme: CDs and DVDs. While you can produce adhesive labels on other types of printer, they generally don't look as good, and some people are very wary of

putting a labelled disc into their computer, especially one with a slot-loading drive. What's the point in giving out a disc if it's never used?

Several inkjet printers and MFDs include a disc adaptor that lets you print directly onto suitable discs, giving a professional-looking result that can include photos and other graphic elements. One recent example is Canon's Pixma MX850.



## CLEARLY, CHOOSING THE RIGHT PRINTERS FOR ALL BUT THE SMALLEST OF SMBs IS NOT A SIMPLE TASK

Clearly, choosing the right printers for all but the smallest of SMBs is not a simple task. According to Harman, a good reseller should be able to carry out a technology audit to help determine whether the existing setup is on the right lines, or if changes would yield savings. For example, if too many pages are being printed on devices that are relatively expensive to run, their replacement with a newer and more economical model may yield "instant savings," he says.

### SOLID INK

The choices for colour printing are usually considered to be between inkjet and laser, but there are others. Oki uses LED technology that simplifies the mechanical design of the printing mechanism, but apart from that both laser and LED printers use the xerographic process (light is projected onto a charged drum to create a latent image; the drum

offering solid ink printing, according to Lewis. The technology has a strong following in advertising, training and real estate businesses, he says. Advantages include good image quality, consistent colour, water-fastness, and compatibility with a wide range of paper types. "The vividness really stands out with solid ink," says Lewis. Furthermore, the cost per page is around 20 to 25

picks up toner particles on the discharged area; the toner is transferred to the page; heat is applied to bond the toner to the paper or other medium). Solid ink printers combine certain elements of laser and conventional inkjet technology. The solid ink is melted and then sprayed through inkjet nozzles — not onto the paper, but onto a heated drum. A combination of heat and pressure transfers the ink from the drum to the paper.

Fuji Xerox is the only company

per cent lower than for comparable laser printers, he claims. Solid ink isn't more widely used largely because there are no low-end models incorporating the tech. The entry point is a mid-range model that sells for around \$2,000.

### MFDs

At one time, multifunction devices were either expensive high-end models or they were very much a compromise when compared with the performance of the same





## FUJI XEROX

**DOCUPRINT C1110**

12ppm A4 colour laser printer

**\$599****PHASER 8560DN**

Up to 30ppm A4 colour solid ink

**\$2,194.50****DOCUPRINT C3290 FS**

Up to 20ppm colour A4 laser MFD

**\$2,528.90**

Other vendors were invited to provide information for this article but declined.

manufacturer's standalone printers or scanners. Today's MFDs are often highly capable devices at surprisingly low prices.

The smallest businesses with low printing loads can be well served by inexpensive inkjet models. Recent products include 'big system' features such as duplex (double-sided) printing and scanning.

For example, Canon's Pixma MX850 combines those features with automatic double-sided scanning, photo printing (including directly from cameras and memory cards), standalone copying, faxing, networked printing and more. It also matches a pigment ink for dense blacks with ChromaLife 100 dye-based inks for colour, including photos — giving "the best of both worlds," according to product manager KC Lu. Heavier-duty models for use by larger groups of users are available from suppliers such as OKi.

**MOBILITY**

Another issue is mobility — many organisations are keen to keep certain staff members out of the office and in front of customers and clients as much as possible. Consultants, sales staff and field service workers have their phones and notebooks, but what about printers?

"The HP Officejet H470b printer can print from a variety of sources, from notebook PCs and PDAs to cameras and memory cards," said Steve Trang, market development manager for business inkjet printing at HP's South Pacific operation.

The H470b has optional Wi-Fi and Bluetooth interfaces to save messing with cables, and its lithium-ion battery is said to be good for as

many as 480 pages on one charge. It could be useful for on-demand printing of forms or brochures when visiting customers, and the optional six-colour Viverna inks do a good job of photo printing.

**CONSUMABLES AND MANAGEMENT**

The cost of consumables and paper can represent as much as 70 per cent of an SME's stationery budget, says Harman. While stationers often treat paper as a loss leader, their margins can be very high on consumables, so businesses may find a useful saving comes from buying directly from the manufacturer instead.

Another way of saving money on consumables is to avoid keeping excessive stocks of ink or toner — apart from anything else, there's a

printers replenished and maintained, you turn the task over to another company, often the manufacturer, and then pay on a per-page basis.

Fuji Xerox's approach is to sell the printer, and then offer 'page packs' that cover consumables and service. The base monthly charge allows 500 mono and 500 colour pages; additional pages cost extra. "You're less likely to get a sting in the tail," says Lewis.

"We have a great pay per page printer program enabling SMB customers to better monitor and manage their output costs," says Van Leeuwen.

One of the reasons why SMEs have shied away from colour printing is a "fear that colour costs

cartridge. After printing 100,000 pages, a solid ink printer will generate around 2kg of landfill, compared with about 70kg for a laser — "that's a very strongly performing product," says Lewis.

On the other hand, the nature of the solid ink process means the ink must be kept at or near its melting point, and this consumes power.

Fuji Xerox is the only vendor in Australia to gain the Good Environmental Choice Australia eco label, which takes a cradle-to-grave perspective on green issues, not just power consumption or waste. "We hope we're not the only ones for too long," says Lewis.

The company's solid ink models have been labelled for some time, and its entire range has now been



## THE SMALLEST BUSINESSES WITH LOW PRINTING LOADS CAN BE WELL SERVED BY INEXPENSIVE INKJET MODELS

risk you may want to retire the printer before you've used all of its consumables. Modern printers will generate alerts shortly before replacement is needed, and in some cases those alerts can go directly to the vendor, who will arrange prompt delivery.

For example, HP Easy Printer Care 2.0 software can monitor and maintain up to 15 HP LaserJets simultaneously, says Van Leeuwen, with a supplies status view that includes an estimate of pages remaining, toner usage tracking, and order consolidation.

And that brings us to the area of managed printing. Rather than worrying about keeping your

would run out of control," suggests Lewis. The software supporting modern printers can help dispel that fear. These packages, such as Fuji Xerox's Auditor, can restrict colour printing to particular users, set limits on the number of colour or mono pages a user can produce, and then report each user's printer use. Other vendors, including HP, provide similar features.

**GREEN**

Green issues are increasingly becoming part of the business buying process.

If you're concerned about waste, solid ink is a clear leader, as the ink comes in a wrapper rather than a

submitted to the program.

Epson agrees with the need for a broad perspective on green issues. Seiko Epson's manufacturing plants have won significant environmental awards, and the company buys from green suppliers as much as possible. That's not to say disposal is being ignored: Epson works with Planet Ark in Australia for the recycling or proper disposal of empty cartridges, and is involved in Victoria's ByteBack program for the collection and disposal of hardware that's reached the end of its life. The latter scheme may go national, according to Pleasants.

"It's a really big issue... and one we're very active in," he says. [GILL](#)

# No 1 in laser printers

**It's official. OKI printers have the best print quality & reliability.\***

Award winning results achieved through superior LED technology giving you sharper prints with true to life colour.

To experience dramatic superior colour for yourself visit [www.oki.com.au](http://www.oki.com.au)



C3530MFP



C5900



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dramatically  
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\*as voted by readers of PC Authority magazine

[www.oki.com.au](http://www.oki.com.au)

**OKI**  
PRINTING SOLUTIONS

# Avoid the

# TOP 10

# PC DISASTERS

How you, and your data, can survive the 10 worst PC disasters. By *Mike Williams*.

**Y**ou might have spent big money on a great PC, installed only the finest software and spent years learning how to manage it all properly, but the First Rule of Computing still applies: things will go wrong eventually. Hardware will fail, you'll delete the wrong file or find your system doesn't boot, and that's it — you're facing a major PC disaster. And if you're panicked into the wrong actions, then the situation can rapidly become worse.

Make just a few careful preparations, though, and it could all be very different. Corrupt start-up files, forgotten passwords, virus infections and even a trashed partition table won't have to get in your way. At least, not as long as you've followed our advice, as you'll have built your own disaster recovery kit using some of the best free tools around.

When disaster strikes, don't panic. If you take the right steps and follow the right procedures you'll stand more chance of getting your PC up and running, or at least getting all or some of your data back. We're going to look at common disasters, show you how to recover from them and also recommend software that can help.

### DEAD DRIVES

PC hardware failure is never good news. But if it's the hard drive then you're looking at a potential disaster, and probably a boot process that goes

no further than a very basic BIOS error message. As long as the drive is spinning though (open the case and listen), there is still hope.

Launch your BIOS set-up program, and check to see if it's recognised the drive. You might find it hasn't because the BIOS settings have changed — maybe it's corrupted due to a failing battery, in which case a quick settings tweak could fix it.

If the BIOS seems okay, but there's a definite drive problem, remove and reconnect any drive cables, ensuring they're making good connections. Try swapping the data cable for another one that you know is working. It's also possible there's a hard drive controller problem: plug the drive into a different channel and see if there's any change.

If you've just added new hardware, or your power supply is failing, there may not be enough watts to run the drive properly. Unplug some other hardware, remove non-essential expansion cards and try again.

Still no luck? If you're not going to pay for professional assistance, there's always the infamous last resort of data recovery: cryogenics. Start gently, placing the drive in a sealable plastic bag, and another to keep it dry. Then put it in the fridge. Leave it for a couple of hours, and then try booting again. If that's no help, move it to the freezer. The chances of

success are slim, and some say this is an urban myth, but plenty of people have reported that it's worked for them, so it has to be worth a try.

Just remember, if you do get the drive working again, don't reboot. Get your data off immediately. It could fail again at any moment — you've no time to waste.

### CORRUPT START-UP FILES

If the boot process begins but Windows refuses to load, you may have a corrupt or missing start-up file. This is occasionally confirmed with an error message specifying the file (usually NTLDR), but you may just be faced with a blank screen.

You can prepare for this under Windows XP by creating a start-up floppy. Locate the files 'boot.ini', 'NTLDR' and 'Ntdetect.com' in the root folder of your hard drive (click Tools > Folder Options > View, and select 'Show hidden files and folders' if you can't see them), then copy them onto a blank, newly formatted floppy. Now, if one of those files is corrupted on the hard drive, you can boot from the floppy instead.

If you don't have a start-up floppy, you can do much the same thing from an XP CD. Boot from the disc, follow the prompts to the 'Welcome to Setup' screen, and press 'R' to launch the Recovery Console. Then type the following commands, pressing Enter after each



- ✗ DEAD DRIVES
- ✗ CORRUPT START-UP FILES
- ✗ PARTITION PROBLEMS
- ✗ LOST ACCOUNT PASSWORD
- ✗ VIRUS INFECTION
- ✗ DELETED FILES
- ✗ STOLEN PC
- ✗ NO INTERNET
- ✗ LOCKUPS AND INSTABILITY
- ✗ UNREADABLE DISCS



# ASTERS

(replace 'c:' and 'd:' with your hard drive and CD drive letters as appropriate):

```
cd..  
d:  
cd i386  
copy ntldr c:..  
copy ntdetect.com c:..  
bootcfg /rebuild
```

You'll need to confirm the steps involved — after that, remove the Windows CD and try booting again. Fortunately, Windows Vista can solve many of these problems on its own with the new Startup Repair tool. Boot from the Vista DVD, choose the 'Repair My Computer' option, select your installation and click 'Startup Repair' to give it a try. If you don't have a DVD, then hold down F8 as Windows boots, select the 'Advanced Boot Options' screen and then click 'Repair your computer'. If you don't see the option, or can't get there, then see the 'Alternative boot technologies' box below for some further ideas on repairs.

## PARTITION PROBLEMS

If the previous techniques haven't worked, you could have a corrupted hard drive. The Windows



IF YOU'RE NOT GOING TO PAY FOR ASSISTANCE, THERE'S ALWAYS THE INFAMOUS LAST RESORT: CRYOGENICS

XP Recovery Console has a couple of commands that may help. After launching it as described previously, try entering Fixboot to repair a faulty boot sector, or Fixmbr to fix the master boot record. These commands can break other low-level tools though, so you may want to use them as a last resort.

Parted Magic ([www.partedmagic.com](http://www.partedmagic.com)) offers a more sophisticated approach to disk tinkering. It's a bootable version of Linux that includes powerful partitioning and data recovery tools, and can be installed on a CD, DVD or USB flash drive. Boot your system from a copy, then launch VisParted to inspect your drive layout. If it all looks good, click your partition and select Partition > Check > Apply > Apply to look for file system errors.

If your partition is missing, click the arrow to the right of the 'Tools' icon, and launch TestDisk. Click 'No Log', choose your drive and select 'Proceed'. Choose 'Intel' for a regular PC partition type, and select Analyse > Quick Search > Yes to begin a search for deleted or lost partitions. The program can also fix partition table problems,

rebuild boot sectors and more. But be careful: make a mistake with this kind of low-level tool and your problems could get even worse. If in doubt, get help from the documentation at TestDisk's site ([www.cgsecurity.org](http://www.cgsecurity.org)).

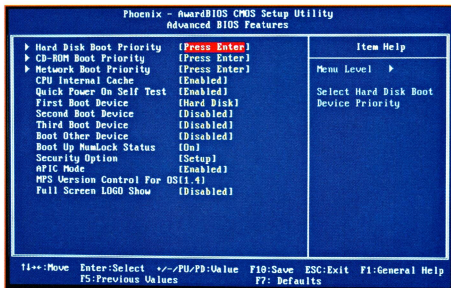
## LOST ACCOUNT PASSWORD

You turn on the PC, enter your password... but it doesn't work. Have you forgotten the real password? Maybe someone's changed it? You

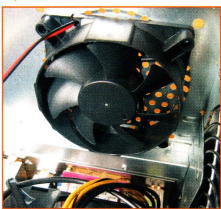
## FACT FILE!

The almost instant communication of email is great, until you realise there's also a major disadvantage: if you lose your temper with someone, it's all too easy to send an angry message you'll regret later. In Outlook, click Tools > Options > Mail Setup and turn off the 'Send immediately' option. Click 'Send/Receive' and schedule automatic sending every 15 minutes, just to give yourself some time to think.

# Avoid the TOP 10 PC disasters



Clean your case vents and fan and your PC should run a little cooler.



Faulty BIOS settings can cause all kinds of odd boot problems.

can worry about that later. Right now the real question is: what happens next?

In an ideal world you'll have planned ahead by creating a password reset disk. Click Control Panel > User Accounts in Windows XP, choose your account, click 'Prevent a forgotten password' and follow the subsequent instructions (you'll need a blank floppy). The instructions are a little different if your PC is part of a domain (see <http://tinyurl.com/35jak>) but are simpler in Windows Vista (Control Panel > User Accounts > Create a password reset disk),

which also now lets you use a USB flash drive.

However the disk has been created, just press Enter when asked for a log-in password, and you'll be prompted to use it. This will ask for a new password, and you'll be able to log in using that. Of course, while this saves you now, it's also a security risk, as anyone with the reset disk will be able to access your system (even if you change your password later). If you make one, keep it safe.

If you're not prepared then life becomes a bit more difficult. You could try logging on using

another account: some PCs come with default user names such as 'User', or with an account called 'Administrator' and a blank password.

The other option is to use a tool that will discover or reset the password for you. The Emergency Boot CD (<http://ebcd.pcmintistry.com>) still works on Windows XP, just about, but hasn't been updated for a while. The Offline NT Password & Registry Editor (<http://home.eunet.no/pnordahl/ntpasswd/>) and Login Recovery ([www.loginrecovery.com](http://www.loginrecovery.com)) are simpler, more effective and can handle Vista, too.

## ALTERNATIVE BOOT TECHNOLOGIES

CONFUSED BY THE RECOVERY CONSOLE? TRY THESE GUI-BASED TOOLS INSTEAD.

When your PC won't boot, it might seem like there's little you can do to fix things, but the reality is very different. There are many alternative ways to kick-start your system, any of which could help you restore normal working order.

The simplest option is to boot from your Windows disc. Both Windows XP and Vista let you drop to a command line where you can try rebuilding start-up files and rewriting key hard drive structures (see 'Corrupt start-up files' and <http://support.microsoft.com/kb/307654>).

Your Windows disc is able to boot thanks to something called the 'Pre-installation Environment'. Essentially it's a cut-down version of the operating system. Microsoft intended this to be used by big corporations to help customise the deployment of workstations and servers, but it's also a very useful mechanism for creating rescue discs. Just drop the Windows installation program, add a file manager, CD burner, antivirus tool, backup program and so on, and you've got yourself a very useful tool for system recovery. BartPE ([www.nu2.net/pubuilder](http://www.nu2.net/pubuilder)) will create

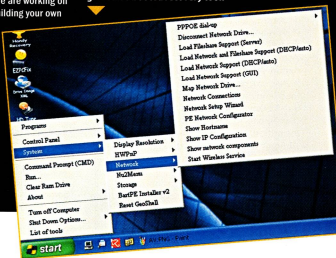
an ISO image of just such a Windows XP disc in minutes: UBcd4Win ([www.ubcd4win.com](http://www.ubcd4win.com)) uses the BartPE core with more up-to-date rescue tools.

Windows Vista has its own version of BartPE, and there isn't quite the same level of quality, free tools available for it yet. But several people are working on this, and you can experiment with building your own discs with help from the WinBuilder scripts at VistaPE ([www.vistape.net](http://www.vistape.net)).

The final option open to you is to boot from a Linux LiveCD and use the tools it contains to investigate and fix your Windows issues. This requires caution, however (low-level tinkering can cause more problems than it solves if you don't know what you're doing), but can otherwise prove very effective. A useful ExtremeTech article explains how this can work with Knoppix ([www.tinyurl.com/](http://www.tinyurl.com/)

bqvzh), while RIP Linux ([www.tinyurl.com/2damy7](http://www.tinyurl.com/2damy7)) is a small distro customised for system repairs.

It looks like Windows, but the 'Pre-installation Environment' is a great disc-booted recovery tool.



## VIRUS INFECTION

The ideas we've suggested so far work fine under normal circumstances, but if your problems are caused by malware then it's often a different story. Conventional tools may not deliver results and if you can't boot your system to fix the problem with anything else, it's a major disaster.

The best approach here is to clean boot your PC from a rescue CD, then use malware detection tools to find and remove the infection. Your antivirus client doesn't provide one? Then simply build one of your own. UBCD4Win ([www.ubcd4win.com](http://www.ubcd4win.com)) is one of the best, frequently updated and packed with useful things. You'll need a Windows XP system to build it, but the resulting CD can be used on Vista systems too, with a few caveats (see the FAQ at [www.ubcd4win.com/faq.htm](http://www.ubcd4win.com/faq.htm) for details).

Download the latest UBCD4Win build and install it on your PC. Launch the program, then point the 'Source' box at the root folder of your Windows XP CD: it'll use those files to build its own system. Click the 'Plug-ins' button, scroll down the list and look for the entries labelled 'Anti-Spyware' and 'Anti-Virus'. These tools may not have the most up-to-date virus signatures, so select each one in turn and click 'Config' to download the latest files. Click 'Build' when you're done to create a CD ISO image file, then use the 'Burn to CD/DVD' option to create the finished disc.

Now boot your infected PC from the new rescue disc, click Start > Programs > AntiVirus tools, and try one of the fully featured programs such as AVG Free or AVPersonal. If they don't help, there are many others, including several quality anti-spyware utilities in the 'Malware Tools' folder. If you persevere there's a good chance the infection can be fixed.

## DELETED FILES

It might have taken weeks, months, even years to create your document, but you can still delete it in a second. And if you empty the Recycle Bin before noticing, or it doesn't get there, then you'll need third-party help to restore the situation.

If you don't currently have any undelete software on your PC, use another system to download a copy of Tokiwa DataRecovery (<http://tokiwa.qee.jp/EN/dr.html>) and copy it to a CD or flash drive. It can then be run from there on your own PC, no installation required, which reduces the chance that you'll accidentally overwrite the data you're trying to save.

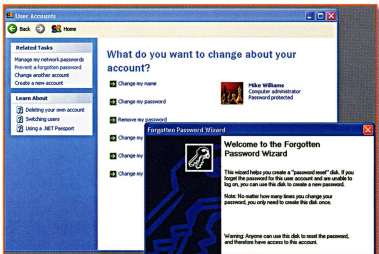
You'll get better results from more powerful programs, such as SoftPerfect File Recovery ([www.softperfect.com/products/file-recovery/](http://www.softperfect.com/products/file-recovery/)) or Undelete Plus (<http://undelete-plus.com>). The latter is most impressive, working on just about every version of Windows, so it's best to install one of these now in order to ensure you're prepared when any problems crop up.

## STOLEN PC

Having your system stolen means not only have you lost access to your data forever, but someone else could be browsing it, recovering usernames, passwords, credit card numbers and more. All you can do now is encrypt the contents of your hard drive.

If you have the Enterprise or Ultimate version of Vista then you'll be able to take advantage of Microsoft's new BitLocker encryption system. But if you haven't, there's no need to feel left out. CompuSec (<http://tinyurl.com/33aa66>) is a free alternative that, if anything, is more powerful, as it encrypts hard drives, CDs, DVDs, memory sticks and more, and works with Windows 2000, XP and Vista.

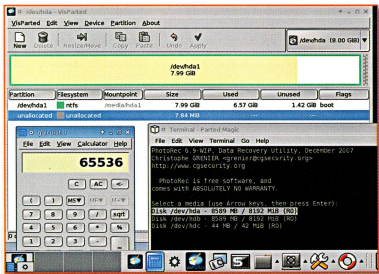
The CompuSec set-up process can take a long time — unsurprisingly, as it has to encrypt your entire drive. (That's a scary prospect in itself, so we'd recommend you run a backup first, just in case there are problems.) But once installed, it's all very straightforward: enter your password before Windows starts and all encryption and decryption is automatically carried out in the background. There's a small performance hit for this, but if you've got any confidential information on your hard



▲ Create a reset disk to recover from password problems.



▲ UBCD4Win is packed with antivirus tools, partitioning and data recovery programs, network utilities and more.



▲ Partition Magic and TestDisk can fix a whole range of common hard drive problems.



# Avoid the TOP 10 PC disasters

## RUN REGULAR BACKUPS

BACK UP YOUR DATA TO SURVIVE ALMOST ANY PC MISHAP.

Hard drive failure doesn't have to be a disaster. If you run regular backups then it need be little more than an inconvenience and you'll be back in action once you've bought the replacement hardware.

You don't have a back-up drive? Then get one. We suspect that your data is worth more than the cost of one.

Don't want to pay for back-up software? Use a free or open source tool, then. The Cobian Backup software ([www.educ.umu.se/~cobian/cobianbackup.htm](http://www.educ.umu.se/~cobian/cobianbackup.htm)) provides more than enough features for most people.

If you don't have the time to back up everything, then you can always concentrate on the most important data. Even just dragging and dropping your Documents folder onto a USB flash drive will

offer some protection.

If you're opting for a pared-down solution, then online backup might appeal. Read and write speeds are poor compared to local drives, but if you're only working with a small amount of data then it's not a major issue, and of course it does help ensure your data survives even major disasters such as a fire.

**Your data is precious. Ensure it stays safe by running frequent backups.**



drive, the security makes it worth the effort.

If you'd like a chance to get your stolen kit back, then you can also sign up for one of many alert services. These typically install something on your PC that will tell the service whenever it goes online, helping to track down the thieves.

### NO INTERNET

You never quite realise how much you depend on internet access until, suddenly, it isn't there. You can't use your email, download things or do that research.

Rebooting your router could be a quick solution. Or there may be a local networking problem: right-click the network icon in your system tray and select 'Repair' to give your system the chance to fix things. Check your modem, too. There's probably an indicator light that tells you whether it's receiving a signal from your local exchange (assuming you're using ADSL). If the signal is down and restarting the modem doesn't help, it looks like there's a significant outage and you should let your ISP know.

If your broadband is down, you could try the alternative of a dial-up connection — assuming you've got a dial-up modem and a suitable cable.

If you can get online but find some sites are

inaccessible, your ISP may be suffering from routing or ISP issues. Try visiting an anonymous proxy such as The Cloak ([www.the-cloak.com](http://www.the-cloak.com)) to see if you can access the sites you need. Or register with the free OpenDNS ([www.opendns.com](http://www.opendns.com)) and use a different group of DNS servers altogether.

### LOCKUPS AND INSTABILITY

It's the ultimate in frustration: you've been working for hours on a document, your PC locks up and you've lost everything. Or have you?

The first rule is to be patient. You may get control back without doing anything at all, so wait for at least five minutes to see what happens. Press Ctrl+Alt+Del to try to launch Task Manager, too. If this loads, press the 'Processes' tab to see what's using the most memory or CPU time. You might be able to recover the situation by right-clicking that process and setting it to a lower priority.

When these options fail, the keyboard status lights don't change and the mouse cursor is frozen, then there's little hope left. As a last-ditch effort, try a hardware change, such as plugging in a USB flash-drive, or removing and reconnecting your mouse and keyboard (if they're USB models). If Windows is working at some level then you've a small chance that this might change the situation.

If these lockups or reboots happen frequently, your PC may be overheating. Check the motherboard disks to see if there's a tool you can use to monitor its temperature; if not, look in your BIOS setup program or try third-party tools such as SpeedFan ([www.almico.com/speedfan.php](http://www.almico.com/speedfan.php)) or Core Temp ([www.alcpu.com/CoreTemp](http://www.alcpu.com/CoreTemp)). If these indicate problems, then remove your PC's case, clean the dust from its fans and vents, and tie up loose cables so they're not blocking air flow. Use your BIOS set-up program for increased fan speeds, and

move your PC away from heat sources. You'll be surprised at the difference this can make.

### UNREADABLE DISCS

It's good to back up your data to CD or DVD occasionally. But it's bad to leave your files there indefinitely: some cheaper discs can become difficult to read within a year or two, even if they're kept in good conditions. If you keep anything precious on CD or DVD, make sure you have at least two copies (ideally on discs from different manufacturers) and check them every few months. But you'll still occasionally run into discs with unreadable areas. This is where specialist assistance is needed.

Unstoppable Copier ([www.roadkil.net/unstopcp.html](http://www.roadkil.net/unstopcp.html)) is one of the best free disc recovery tools. It'll repeatedly try to read problem blocks of data, and reconstruct a file even if part of it can't be recovered. CDCheck ([www.kvipu.com/CDCheck](http://www.kvipu.com/CDCheck)) is good too, while ISO Buster ([www.isobuster.com](http://www.isobuster.com)) comes in both a free and commercial version. It makes sense to try the free version first, but the commercial edition adds many features, including the ability to recover packet-written data and support for high-def discs. It costs around \$35 and the extra capabilities could save you time in the long run. **ETG**

## FACT FILE!

Re-installation is a handy last-resort option when Windows just won't behave — until, that is, you realise you've lost your product key. Fortunately, it's easy to recover. Grab a copy of ProKey ([www.nirsoft.net](http://www.nirsoft.net)) and it'll display keys for Windows, Office (after 2000), Exchange Server and Windows Server.

## FACT FILE!

Outlook Express and IE will happily store passwords, but they'll provide no way to recover them later — bad news if you need to enter the details elsewhere. Running Protected Storage Password ([www.nirsoft.net/utilities/pspw.html](http://www.nirsoft.net/utilities/pspw.html)) will reveal them, and you can find many other password recovery tools under the 'Utilities' link at the site.

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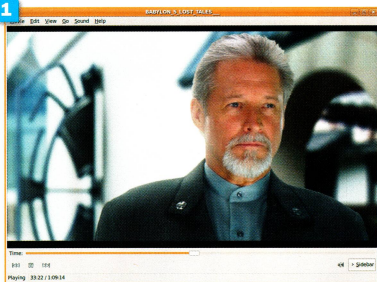
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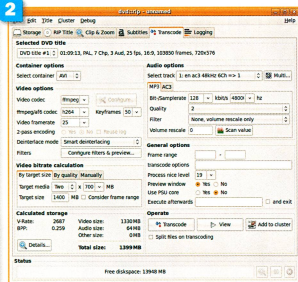




1



2



# Digging into DVDs

HD-DVD is dead — long live DVD! *Ashton Mills* explains how, even with Blu-ray's recent format ascendancy, your DVD collection is just as relevant as ever.

With the Blu-ray and HD-DVD war now over, and the next-generation format decided, we're left to ponder about our beloved DVD collections. Even though future drives will be backward-compatible, the discs themselves are susceptible to decay, not to mention damage like scratches from everyday use. And they will be irreplaceable. The content cartels would love you to buy Blu-ray versions — if indeed they make Blu-ray versions of all your classics, which is doubtful — but instead you can simply make a backup of your DVDs for posterity.

Additionally, in this age of media centre PCs and network streaming, you can archive your entire collection not just to preserve it, but to create a movie jukebox to watch movies on demand without ever fiddling with discs (1). All you need is the right tool for the job.

## DVD RIPPING IN UBUNTU

There are quite a variety of tools under Linux to read, copy and encode DVDs. Some are easier to use than others, and some provide

more features than others, so here we're going to look at a range of options — six all up — and see what they provide.

It's important to note that these programs are really just front ends to common Linux tools under the hood. This means, if you want to, you can understand much more about the process by reading up on the tools themselves, and this can certainly be a great way to learn about codecs and compression in general. But overall, the front ends are all about streamlining the process, and as you'll see if you try these programs — there can be a lot of tweakable options.

All of the following programs are available from Ubuntu's Synaptic repositories and the Applications > Add/Remove menu. They will automatically install any dependency tools they require.

## DVD::RIP

dvd::rip is one of the more complex and comprehensive programs, revealing almost the full extent of the configurable options for the underlying toolsets (2).

For example, being able to set two-pass encoding, keyframes, de-interlacing, xvid and ffmpeg options, and a full range of pre and post filters. You can not only use dvd::rip to create compressed AVI, MPEG or Ogg Theora files, you can spend a lot of time optimising for the best quality/size trade-off. Some knowledge of these various options is helpful, as dvd::rip itself doesn't explain them for you. It's also the only program we look at here that supports clustering — you can run dvd::rip on multiple machines and spread the compression workload of a network. Keep in mind encoding a full DVD even on a high-powered computer can take a number of hours, so this is one feature that could help cut down on your encoding time. Importantly, then, it also supports threads, so you can take advantage of dual-core and quad-core machines to speed up compression. Note that dvd::rip can't duplicate DVDs; it's designed to encode them to other compressed formats for playback on computers and media devices. So, it's an excellent tool if you're

already familiar with encoding.

## GNOMEBAKER

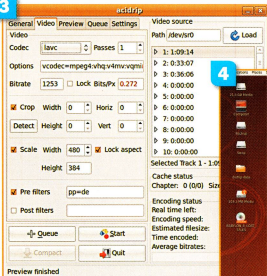
GnomeBaker is a popular Gnome CD and DVD authoring package before Brasero came along and became the default for Ubuntu. It doesn't support the ability to re-encode DVDs to other formats (such as for streaming to a media server), although it does have an option to duplicate non-protected DVDs. Primarily, GnomeBaker makes it easy to build data CDs or DVDs with an easy-to-use file manager interface, and doesn't swamp the user with a ton of options. In fact, there are probably too few to allow enough versatility for anything but basic copying or imaging. It's not the best tool for backing up video DVDs as a result, but it makes burning .iso files a snap.

## ACIDRIP

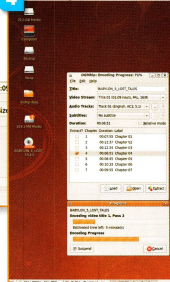
AcidRip is similar to dvd::rip in that it provides access to many of the more complex options of the underlying tools, though it relies on mencoder (the encoding portion of Mplayer) to do all the



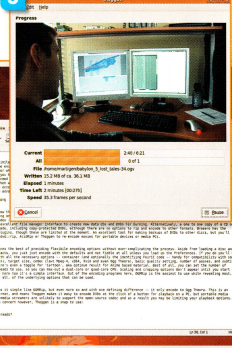
3



4



5



work (3). On the other hand, once you've settled on your chosen container format and codec (for which you can use the staples of xvid, lavc, and x264) the actual command options are listed in a text box and easily editable if you know what you're doing. As with dvd:rip you can easily scale, crop, and apply pre and post filters, though with the filters you need to know mencoder commands to do so. Once you're happy with the settings, you can add them to a queue and tell ac3rip to process them all at once when you're ready, and optionally while using a preview window on the fly. ac3rip reveals enough detail to make quality encodings without being as overwhelming as dvd:rip, and about the only missing feature is multi-threaded support — it doesn't take advantage of dual-core or quad-core CPUs (for the moment). If you don't mind missing threaded encoding, ac3rip might be a better option than dvd:rip if you're new to the game.

#### BRASERO

Brasero is now the default CD/DVD burning application in Ubuntu, and is usually invoked directly through the interface (for example, right-clicking on an .iso file and selecting to 'Write to disc'). However, you

can also start the full program from Applications > Sound and Video > Brasero. Here you are presented with more options for building and burning CDs and DVDs. Similar to GnomeBaker there is an excellent file manager interface to create new data CDs and DVDs for burning. Alternatively, a one-to-one copy of a CD or DVD can be made, including copy-protected DVDs, although there are no options to rip and encode to other formats. As a result, Brasero is an



## YOU CAN ARCHIVE YOUR ENTIRE COLLECTION NOT JUST TO PRESERVE IT, BUT TO CREATE A JUKEBOX TO WATCH MOVIES ON DEMAND

excellent tool for making backups of DVDs to other discs, but you'll need to use dvd:rip, ac3rip or Thoggen to re-encode movies for portable devices or media PCs.

#### OGMrip

OGMrip combines flexible encoding options without over-complicating the process (4). Aside from loading a disc and selecting tracks, you can just encode with the defaults and not fiddle at all. Unless you load up the Preferences. If you do you'll be presented with all the necessary options —

container (and optionally the identifying FourCC code — handy for compatibility with some media players), target size, codec (lavc MPEG-4, x264, Xvid and even Ogg Theora), basic quality setting, number of passes, and subtitle options. There's even a toggle for 'Cartoon', aka. optimum result for Anime-based material. Best of all, you can set the number of encoding threads to use, so you can max-out a dual-core or quad-core CPU. Scaling and cropping

to encode DVDs at the click of a button for playback on a PC using it, but portable media devices and media streamers are unlikely to support the open-source codec, and as a result you may be limiting your playback options. If that's not a concern, however, Thoggen is a snap to use: after selecting a chapter or the whole DVD you just set picture size, target file size or quality, and output file — Thoggen will do the rest. While converting, it also displays a preview screen (5).

options don't appear until you start a process, but here too it's a simple interface. Out of the encoding programs here, OGMrip is the easiest to use, while revealing most, although not all, of the underlying options that can be used.

#### THOGGEN

Thoggen keeps it simple like OGMrip, but even more so with less options and one defining difference — it will only encode to Ogg Theora. This is an excellent format, and Thoggen makes it easy

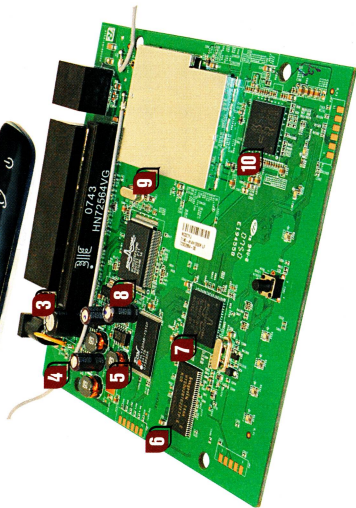
Unfortunately, there are no options for threading an encoding, nor any in-depth quality options, but aside from this it's a point-and-shoot encoder that anyone can use, if you don't mind sticking to Ogg Theora.

These are not all the programs you could use; just the more popular ones using Gnome available in Ubuntu's repositories (there are more, such as the KDE-based K3b, worth checking out also). But when it comes to preserving your collection, or shifting to other formats, there are plenty of options available. [lwn.net](http://lwn.net)



This month, we're exploding the Linksys WRT310N Wireless-N Gigabit router, a net-sharing router and 4-port switch, with a built-in speed- and range-enhanced wireless access point.

- 1 Face plate (check out the design!)
- 2 Indicator panel — displaying ethernet connectivity/activity, wireless connectivity/activity, power and internet connectivity.
- 3 Ethernet isolation transformer
- 4 Wireless RF lead to internal antenna
- 5 CMOS flash memory
- 6 Synchronous DRAM
- 7 Networking processor
- 8 Ethernet switch supporting 1xWAN 4xLAN ethernet ports
- 9 Wireless radio module
- 10 MAC/baseband controller for 802.11a/b/g/n
- 11 & 12 Internal PCB padding
- 13 Shielding
- 14 Internal wireless antenna

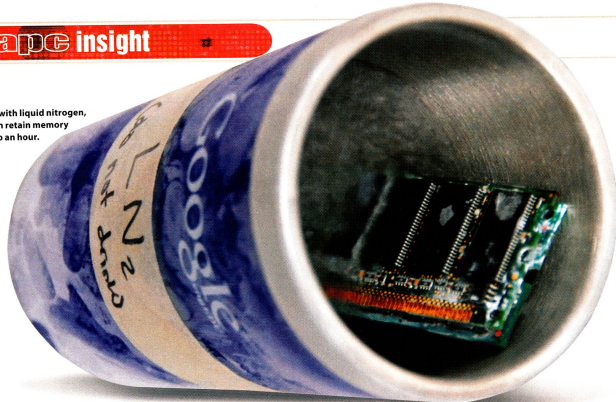








Cooled with liquid nitrogen,  
RAM can retain memory  
for up to an hour.



# RAM VULNERABILITY EXPOSED!

New encryption software is being rendered useless by criminal cunning, increased accessibility and poorly designed computer hardware, says *Ben Sillis*.

**J**acob Appelbaum has had a busy few months. The San Francisco programmer first made headlines highlighting a flaw in OS X that allowed anyone to pull the password to a Mac out of its memory. Apple, in its infinite wisdom (and dare we say, arrogance) has chosen to ignore his findings.

Then, in March, he and fellow academics at Princeton University published a paper revealing a potentially fatal flaw in popular disk encryption technology. Their specially developed software analyses the target computer's RAM for sequences that look like parts of the encryption key in use (otherwise known as 'key schedules'), which allow users to get around even 256-bit security. This is a serious discovery: Vista's BitLocker, Apple's FileVault and freeware favourite TrueCrypt are all vulnerable to their software, aptly named BitUnlocker.

## THE BIG FLAW

Both flaws are caused by a single issue, and one which goes to show that no amount of security will help you if a hacker gets physical access to your machine — that memory stays in the RAM after power has been cut off.

"Let's say you're in a coffee shop and you leave your Vista notebook screen-locked and tied to a table while you take a trip to the bathroom. All I would have to do is force a reboot to a USB drive running our custom software, and I could work around BitLocker," says Appelbaum.

Of course, not every thief has the time to sit in Starbucks and sip a frappuccino while Vista starts up. But the team also found a second physical vulnerability: rapidly cooling the PC's memory after shutdown gave them enough time to install it in another machine and successfully reboot, without much

of the information being lost.

Now this might be a difficult trick to pull off; if you've left your computer switched off, there's going to be nothing in its RAM that's worth stealing. Slightly more worrying, though, is the vulnerability to their program of a laptop left in sleep mode. Steal that and an enterprising individual has all the time in the world to leisurely look for your keys and open up your entire system.

## WHO'S TO BLAME?

Still, all the blame can't be left at the big M's door for once. RAM has been a commonly ignored weak point of every system, and people have known about this for decades. Amiga and Sinclair Spectrum homebrew users would reboot and scan the residual memory of their systems in order to rip graphics and sound from software. This was going on 25 years ago, making it slightly

worrying that BitUnlocker is simply a more sophisticated version of the same principle. This fundamental flaw in architecture has been conveniently ignored by everyone for far too long, and that's telling of something even more basic. Human error.

Anyone concerned about the safety of their personal data can take significant steps to minimise the threat. Firstly, change the BIOS to prevent booting from an external device, password-protect it and set your system not to cache keys at all. It's easily done. The problem is that the people who really need to do this are the ones least likely to. The private sector has already figured this out: banks realised long ago that the safest way to keep their computers secure was to unplug them and physically lock them away behind a bad old-fashioned bricks-and-mortar wall. But it's the seemingly oblivious

public sector that should be most alarmed by these rather alarming developments.

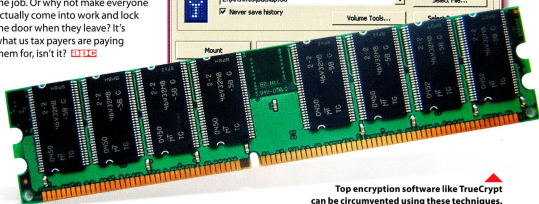
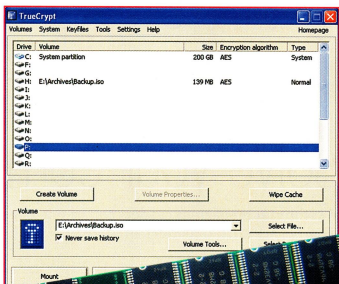
#### THE RESPONSE

Civil servants issued with laptops — choc full of sensitive data, naturally — seem to be losing them faster than the government can churn out impractical green papers these days. In January, in the UK a Ministry of Defence laptop containing the personal details of 600,000 people — that's equal to one per cent of the UK population — was stolen, and Defence Secretary Des Browne was forced to admit that two other similar thefts had occurred since 2005 in that department alone. That's fairly shocking.

However, the inevitable righteous media backlash has entirely missed the point. Take the scandal last year, again in the UK, that followed the loss of the child benefits' database on two CDs. Commentators were up in arms when it turned out the discs were merely locked with a password. Experts called for better encryption, but recent events just go to show that even this isn't going to be good enough in the long run. After all, it's

obviously not even possible to teach everyone the difference between a hibernating and powered-down machine, or even that your car seat isn't the most sensible place to leave a PC overnight. But now is the time to start thinking about it. Is that machine asleep, or is it off?

The paper's authors say there are no sure-fire remedies. The only solution is a fairly ludicrous one: ban sensitive data from being kept on laptops. That sounds about as practical as banning laptops altogether, although we have so many external storage choices that an encrypted USB stick would do the job. Or why not make everyone actually come into work and lock the door when they leave? It's what us tax payers are paying them for, isn't it? **OUTTIC**



Top encryption software like TrueCrypt can be circumvented using these techniques.

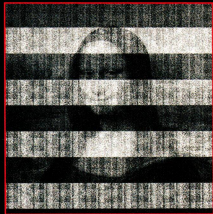
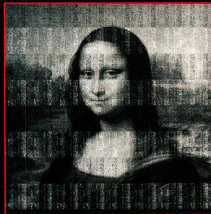
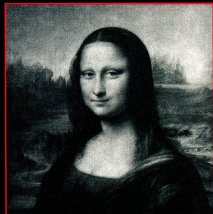
## MEMORY FREEZE DATA THEFT

Princeton scientists found that RAM in computers at room temperature kept a substantial amount of memory for 15 seconds after the power was shut off, but a machine cooled to -50 degrees Celsius will retain its memory for minutes longer — plenty of time for BitLocker to work its magic. To demonstrate, the team used an image of the

Mona Lisa on the RAM. Supercooled, the image can be restored with almost crystal clarity, even if the RAM has had no power for 10 minutes.

Unfortunately, doing this is easier than it sounds: a common air duster spray can from the supermarket, inverted to squirt the propellant (which also happens to be a

refrigerant) will do the job. And removing the keyboard to get to the hardware on most laptops, meanwhile, is as simple as lifting it up. Want to stop this? Buy a MacBook Air — there's no pulling the soldered-in memory out of one of those. Or changing the battery. Or using more than one USB port...



These Mona Lisa images were retrieved from the unfrozen RAM of a computer with its power cut. As you can see, the quality of image degrades over time. From left to right: Five seconds, 30 seconds, 60 seconds.



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HARDWARE

WINDOWS

SECURITY

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### QUESTIONS ANSWERED

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### HARDWARE

#### USB KEY WON'T APPEAR

**Q** I regularly use a USB flash drive to copy files from computer to computer. My work computer has many mapped drives and, although the USB pen is recognised and loaded, it simply won't show in the list of drives.

*Brian Smith*

**A** When a removable mass storage device is connected, Windows will attempt to assign the next available drive letter. In a network environment, the drive letter assignment sometimes fails because Windows is unable to assign drive letters that have already been assigned to network drives. This can be frustrating because Windows will accept the USB device and load the necessary drivers but will not be able to display the USB device in Explorer. Sometimes a simple reboot will force Explorer to reassign drive letters, but if network drives are persistent the SB device can remain hidden.

The solution is to assign a new drive letter in the Logical Disk Manager console: right-click on My Computer and choose 'Manage' from the menu. Choose 'Disk Management'. Right-click on the removable device and choose 'Change Drive Letter'. Assign a new drive letter.

Windows will use this new drive letter each time the drive is connected.

### HARDWARE

#### MIRRORED SYSTEM DRIVE

**Q** I would like to add a RAID 1 setup to my computer, but I want it as the Windows partition so that my data is more secure. However, I don't really want to go through all the hassle of having to re-install Windows again, because I've got what I consider to be a pretty much perfect setup at the moment. Can you give me any advice on how I can achieve this?

*Jon Saunders*

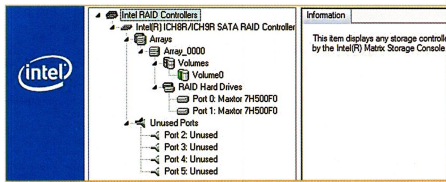
**A** As you'll need to set up your RAID array outside of Windows, and because this array needs to be bootable, you will need to use some third-party software. We've recently done this with an XP machine, but the procedure will be identical if you are running Vista.

First of all, install some drive imaging software — we used Acronis True Image. Create an image of your Windows hard drive, and save that onto a second drive or an external drive. Shut down your PC, add your two RAID drives, then create the array, making sure you set it up as a bootable array. Go into Windows and use the imaging program to copy the image across onto your RAID array. Restart and change your BIOS to set your RAID array as the boot drive. Restart again and you should now have Windows on your RAID array!



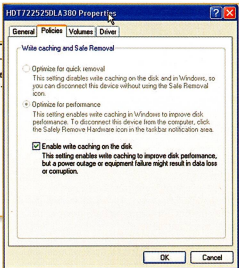
USB key won't appear? Assign a new drive letter in the management console.





**Mirrored system drive:** to transfer your Windows partition to a RAID array, use imaging software.

**Delayed write failure:** write caching can cause problems in the event of a power failure.



## HARDWARE

### DELAYED WRITE FAILURE

**Q** I recently had a problem with my second SATA internal hard disk drive in my computer. I was getting an error message saying: "WINDOWS DELAYED WRITE FAILED". Windows was unable to save all the file data for the file E:\5mft. Then I lost access to the drive for long periods. I then lost all the data. I thought the disk itself had failed, or possibly that it was being caused by a motherboard problem, because I had already tried a new cable. I built a new machine, but I'm now getting the same message as before and am losing access to my second internal drive, but this one is new.

TM Le Sain

**A** This is usually a symptom of a failing drive or a faulty cable. Windows uses something called write-caching to write information to your hard drive in the background, and this is what's failing. As you've replaced the hard drive, motherboard and cable,

it would suggest that something else is at fault. This narrows it down to your power supply. Either your power supply isn't powerful enough for all the items in your PC, it can't supply enough power to your hard drive, or its faulty. Either way, by changing your PSU, you should fix the problem.

## HARDWARE

### OVERCLOCKING RAM

**Q** How do you overclock RAM? My current RAM is Kingston & Transcend Information. I want to overclock my RAM depending on how much I overclock my CPU. If I increase my bus speed to 333MHz, I wouldn't need to overclock my RAM, as it would be running 1:1 with my CPU?

Reiner Hasan

**A** RAM is overclocked the moment you touch the RAM bus in the BIOS, as the speed your RAM runs is tied in to the FSB (it's double-pumped, as opposed to quad-pumped, however). So, moving to a 333MHz bus speed, your RAM will be running at 667MHz, still within

spec, at a 1:1 ratio. If you want to go past 333MHz, then you may need to adjust the ratio on the RAM, as I don't have much confidence that 4GB of mixed memory will play nicely together over spec.

## WINDOWS

### VISTA SECURITY CENTER

**Q** I recently freshly installed Windows XP Pro with Service Pack 2 (previously had Service Pack 1). The computer is not connected to the internet and never will be. Unfortunately Windows Security Center keeps popping up with a message telling me my computer may be at risk even though I have turned everything off. I understand that I cannot remove this program, but how can I disable it?

Neil Lofts

**A** The following steps will disable pop-up messages generated by Windows Security Center on a non-internet connected PC after installing SP2.

1. First, click on 'Recommendations' on

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Firewall of 'Security Center'. (Control Panel > Security Center).

2. Click checkbox 'I have a firewall solution that I'll monitor myself. Note: Windows won't monitor your firewall status and won't send you alerts if it is off.' and click OK.

3. Click on 'Recommendations' on 'Virus Protection'.

4. Click checkbox 'I have an antivirus program that I'll monitor myself. Note: ...' and click OK.

The above steps will stop pop-up messages as well as remove the Security Center icon from the task bar.

Optional: It is not necessary, but, if you want to disable Automatic Updates as well, do the following.

Open Control Panel from Start, open Automatic Updates and click on the radio button 'Notify me but don't automatically download or install them' and click OK.

Please note that if you transfer files from floppies, CDs or iPods, it is highly recommended to have an antivirus installed on your PC with the latest signature files.

**Pravin Pradhan (currently working as Desktop Support at CBA).**

## WINDOWS

### VISTA'S 404 ERRORS

**Q** Following my upgrade to Windows Vista my network is behaving very oddly. Emails sent from Outlook 2007 sometimes go and sometimes don't, and Internet Explorer pages sometimes don't load. I've bought a new router and this hasn't made any difference. Should I change my service provider?

**Terry Jones**

**A** Mindful of criticism towards the XP networking stack, a brand-new TCP implementation was developed for Vista. This is a complete reworking of the previous BSD implementation produced in the 1990s. The Vista TCP is harder and standards-compliant, which is a double-edged sword. While

manufacturers were able to develop equipment that worked fine with the 'old' NT TCP, issues that weren't apparent are coming to the surface when new Vista and Server 2008 equipment is attached to the network.

One of these issues is related to TCP window size. In previous versions of Windows the TCP window size was a registry DWORD (TCPWindowSize). The value of this DWORD could be changed either manually or using one of the various 'tweaking' utilities. The TCP window is intended to make the best of available bandwidth, so by analysing your connection properties and making custom changes to the registry, some performance benefits could be obtained. In Windows Vista these registry keys don't exist, so manual tuning is unavailable. Instead, Vista manages the size of the TCP window automatically by monitoring connection speeds on the fly and making changes where appropriate.

In some cases, particularly when Vista is connected to budget routing equipment, Vista is unable to accurately measure connection properties and so the TCP window size becomes unusable. If you suspect this is happening to you, there's a manual change you can make using a netsh command. These changes need to be made using elevated privileges or the command simply won't be written to the operating system. Unless the command shell is run in elevated mode, all changes are made to virtual copies of the registry, one of the reasons why Vista is much more secure than previous versions of Windows.

At the Start menu type 'cmd', press and hold Ctrl+Shift then press Enter. Answer the UAC 'challenge' and work in the elevated command shell. Within the command shell type the following after C:\:

```
netsh int tcp set global
autotuninglevel=disabled
```

Reboot the PC and test. If you wish to return Vista to the default state, enter the following code:

```
netsh int tcp set global autotuninglevel=normal
```

## WINDOWS

### VISTA'S UAC IN SILENT MODE

**Q** I love the new Parental Controls that come with Windows Vista. As long as that is, as you have User Account Control enabled. I have discovered that if you disable UAC to stop all the annoying confirmation dialog boxes, then your child no longer has to ask you to temporarily allow any restriction overrides. Your child needs to ask you to enter a password to get permission to install programs or access disallowed web sites.

**Sarah Maupin**

**A** Yes, you are correct. It does indeed appear that you can either have fully operational Parental Controls, or you can remove the annoying UAC pop-up windows, but you cannot have both. Luckily, though, there's a solution in the form of a program called TweakUAC (<http://tweak-uac.com/download/>). The great feature this utility has is the ability to leave UAC running but to place it into 'quiet mode', which lets you suppress the prompts of UAC without turning it off completely.

In this mode, you keep all the positive effects of UAC, such as Internet Explorer operating in the protected mode, applications starting without the administrative privileges by default and Parent Controls overrides, but you will no longer see the 'Windows needs your permission to continue' message whenever you attempt to make a change to your Vista configuration, or when you run a program that needs administrative rights.

## WINDOWS

### HARD DRIVE CHATTER

**Q** My Vista laptop is constantly accessing the hard drive. In fact, I'm starting to worry that something is wrong with my computer. I've used Task Manager to look at processes, but can't figure out what's going on.

**Simon Evans**

## TIP...

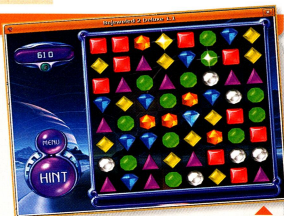
## LINUX

### RUN WINDOWS ON LINUX WITH WINE

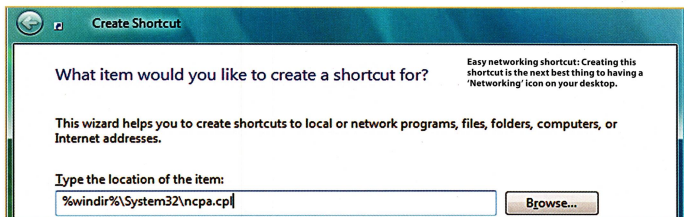
Using Windows programs in Linux is not as difficult as it sounds, thanks to the emulators available. The most well known of these is Wine, which uses a recursive naming scheme ('Wine Is Not an Emulator'). From a browser, all you have to do is click on the download link and, when Firefox opens the file, select 'Open with wine (default)' and click on 'OK'.

The program then runs as it would on Windows, all from a pseudo c:\ directory in your home '.wine' directory. From the main menu, the program appears under the 'Applications', 'Programs', program-name.

If your program runs as full screen, as many games do, but you want to run it in a window, just press Alt+Enter as you would if you were running Windows. You are likely to suffer a lower frame rate in 3D games under Wine, although most will be playable. Also, as you are running with the security of Linux, if a downloaded Windows program turns out to be malicious, it only effects resources that you have access to, effectively limiting it to your own home directory.



Simply install Wine, then run Windows applications in Linux using 'Windows' mode.



Easy networking shortcut: creating this shortcut is the next best thing to having a 'Networking' icon on your desktop.

**A** Windows Vista is much harder on hard disks than previous versions of Windows. One of the reasons for this is the disk indexing service (Windows Search) which is constantly running in the background preparing an updated index of files and folders inside your PC that's used whenever you search for something. Depending on your computer configuration, this search service may be working harder than it should, perhaps trying to index the Windows folder which would include changes to swap files and registry. Check for problems using Control Panel > Indexing Options. From within indexing options choose Modify > Show All Locations. The index service is often incorrectly indexing the Windows folder.

Other reasons for the constant hard drive access may be an antivirus program scanning your hard disk, or possibly a third-party application such as the woeful Google Desktop Search. Fortunately, Vista's Reliability and Performance Monitor contains a disk access utility that can help diagnose these issues. At the Start button, type 'Reliability and Performance Monitor' and answer the UAC challenge.

When the Reliability Monitor starts, expand the 'Disk' section and click on the 'Read' column. The figures here are disk read requests in bytes per minute. Top of our list is the NT Defragment

service, which is always running in Vista to maintain disk performance. Examining the disk defragment properties (Disk Defragmenter) we found Vista had scheduled a disk defrag for 1am every Wednesday and had waited until the PC wasn't being used to start the task.

## NETWORKING

### EASY NETWORKING SHORTCUT

**Q** I'm used to finding my network connections in XP by simply right-clicking on the 'My Network' icon on the desktop and choosing 'Properties'. However, in Vista this has changed and I'm finding that this slows me down. How can I simply view my network properties in Vista?

Tai Walker

**A** You can access all the networking options from the Start Menu, although this isn't as easy as it was under XP. Even changing to the Windows 'Classic' theme and using 'Classic' start menu properties won't change this. The reason is that Vista networking functionality has many more features built in than XP had and so Vista needs to be able to offer you all those new features via a brand new system of menus. Right-clicking on the 'Network' button on the start menu and choosing 'Properties' then

'Manage Network Connections' from the 'Network And Sharing Centre' will take you where you want to go.

On the other hand, a simple shortcut can be created which will produce the network connections dialog at the click of a mouse. Create a new shortcut on the desktop or on the Start menu (or pretty much anywhere) and enter the following into the properties for the new shortcut:

```
%windir%\system32\ncpa.cpl
```

Use this new shortcut to open Vista Network Connections in one click.

## LINUX

### KILLING WINDOWS MANUALLY

**Q** I sometimes get a window that won't die. I can grep 'ps aux' and use 'kill' or use 'top' but there is some guesswork as to which PID I need to kill. Is there a more direct way?

Jim Helms

**A** Processes that won't die occur from time to time on all operating systems and each one has its own way of handling them. On UNIX-like systems, there are a number of ways of dealing with these.

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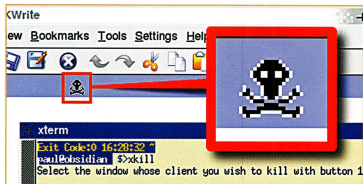


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**ninemsn**



Killing windows manually: this cursor is armed and dangerous — use it with care.

For the readers that don't know, from the command line, you can grep a list of processes for a process by name (here, hypothetically called 'progname') by entering the following, which will give you a list of PIDs to kill:

```
ps aux | grep progname
```

Or, more concisely, by using the educated function pgrep like so:

```
pgrep progname
```

Alternatively, if you have a process that is gobbling up processor time, you can see it by using 'top', which will display the process list according to how much processor time they are using. Pressing 'K' will freeze the list and allow you to kill the process by typing in its PID.

However, if a program has multiple windows, or you have several copies of the same program running, there is a more explicit way of doing this. At the command line, type 'xkill' and the mouse will change to the skull and crossbones, allowing you to click on the offending window and kill that program. The only thing that can go wrong is that the program terminates itself and the window disappears before you have a chance to kill it, thus leaving you with an armed and dangerous mouse that will kill the first thing it clicks on. If you think this might happen, you can always open up another window beforehand (such as a terminal or text editor) so that you can click on that if necessary.

Getting started with IIS: despite being packaged with Windows, the number of IIS installs still lags behind Apache's.



## HOME THEATRE

### OUTPUT TO A TV

**Q** I have an HD-ready TV and I've bought a link cable to connect my laptop to the TV. However, when I put the preset PC channel on the TV I see a message on the TV screen saying 'no PC input'. What do I need to do to make my PC compatible with my TV?

Kevin Groves

**A** It depends on what type of cable you've used to connect your laptop to the TV. The best connection is either VGA or HDMI, if your laptop has them. HDMI will send the correct signal to your TV, and shouldn't need much setting up. If you use VGA, then you'll need to activate the port, usually by pressing the function button then one of the F keys, or by using the display properties (right-click on your desktop). Some TVs don't accept laptop resolutions, so you'll need to use a different res or a tool like PowerStrip to change your laptop's resolution to one which your TV supports.

## INTERNET

### GETTING STARTED WITH IIS

**Q** What options are available to me for a web server running on Windows?

Greg Lowes

**A** There are many third-party applications, but the most well-known are Apache and Microsoft's own Internet Information Services. The latter is an optional package with the more high-end versions of Vista and XP. Although Apache is used on the majority of Linux-based servers, it has less of a monopoly on Win32 environments.

If you want to try IIS, click on Start > Settings > Control Panel > Programs and Features and then, in the dialog box's left pane, click on 'Turn Windows features on or off'. Once you've done that, click on 'Continue' and then wait for the 'Windows Features' list box to populate itself. Check the 'IIS' box and click on 'OK' then wait.

Once the dialog box disappears, you should have a running installation of IIS. You can check this out by opening up your favourite web browser and typing 'localhost' in the address bar. You should get something like our screenshot (above right).

Now, navigate to 'C:\inetpub\wwwroot\' and see that the html document you have seen is called 'iisstart.htm' — this displays the image 'welcome.png'. You can replace this with your own document called 'index.htm' or 'index.html' and that will be displayed instead. With this up and running, you can now play around with it, developing your site in a live directory. [bit.ly](http://bit.ly)

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# Ask the questions

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**Q** I have a hard drive which is partitioned into three drives, (D: E: & F). I had been getting a message upon trying to access each one of those drives, saying 'The File or Directory is Corrupted and is Unreadable.'

Upon rebooting the next time, Chkdsk ran itself during the booting process and scanned and fixed the problem on drive D: only. I then rebooted again and Chkdsk ran again and fixed drive F: as well. But on the next reboot Chkdsk failed to run as I expected.

My problem is now that Chkdsk doesn't run itself anymore (I have tried to schedule it to run on the next reboot, but it does not execute) so my remaining partitioned drive (E:) is still inaccessible and unreadable as before. There is some important data on that drive I want back, is there anyway I can get my drive E: back? I have Windows XP Home SP2.

**Brett Estelow**

**Q** I am experiencing a problem whilst trying to install SP1 for Vista Ultimate edition. During the update process I receive the

following error message: 'An internal error occurred while installing the service pack. Error code: 0x80070490. See <http://go.microsoft.com/fwlink/?LinkId=101139> for details.'

I have gone to this link and attempted all suggested resolutions without success. I have also done some extensive research online at various forums and there does not seem to be much on this problem in the context of updating Vista with SP1.

**Nick Jansen**

**Q** I would like to know if there is any way of limiting MSN usage by time. We have teenage children in the house and I am able to limit the number of hours of internet usage through Net Nanny. But although it's possible to pause web access through Net Nanny, MSN access is not affected.

Ideally, I would like to have in place a control that limits MSN usage per day to a certain amount of time. Better still, if the hours of access can be controlled too.

**Danny**

**Q** When I save a .psd file in Photoshop CS3, it's producing totally black preview images. These are thumbnails you see when you try to open a file in Photoshop or when you are looking at a file listing in Windows' My Computer (and maybe Explorer, too). I am using Vista Ultimate. If there is a wrong setting, can you recommend a solution to this problem?

**Peter**

**Q** Recently I just bought a second hard disk of 160GB. I put it as master, but after the installation of XP Pro, it only shows 128GB. The system partition is FAT32, and the rest of it is in NTFS. Is this normal?

**Ricky**

**Q** For some months I have had a problem with Microsoft Update. When I shut down, it installs the same update 'Security update for Microsoft XML core Services 4.0 Service Pack 2 (KB936181)', and when I start up again the update shield reappears in the task bar almost immediately. Anyone know how to stop this?

**Don Riley**

# Answer the questions

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# Building a small business network

## WHAT'S COVERED

### Overview

In this new Masterclass, Jarrod Spiga walks you through the process of setting up a small business IT infrastructure. No IT training is assumed. At the end of the Masterclass, you should know the fundamentals of setting up a server-based network to run any small business.

## ABOUT YOUR TUTOR

### Jarrod Spiga

Jarrod is an infrastructure architect and data centre engineer for Visionbytes, a company that provides digital video mining technologies and services to some of the world's largest media companies and many government departments worldwide. Jarrod also works as a technical consultant, assisting businesses during infrastructure installation and upgrade projects.



## COURSE SCHEDULE

- **Sept '07** Analysis
- **Oct '07** Preparation
- **Nov '07** The Windows path, part 1
- **Dec '07** The Windows path, part 2
- **Jan '08** The Windows path, part 3
- **Feb '08** The Linux path, part 1
- **Mar '08** The Linux path, part 2
- **Apr '08** The Linux path, part 3
- **May '08** Mac in the mix
- **Jun '08** Swing Migrations

You might be handy with a PC, but what if you had to look after the back end of your business? How would you set up and manage the servers, the network and the server applications?

## Part 10

# Swing Migrations

The next version of Microsoft Small Business Server (due for release in the second half of 2008) will be a 64-bit architecture release only, while SBS 2003 is only available on 32-bit platforms. As a result, it will not be possible to simply 'upgrade' to the newer release.

**I**n order to perform this upgrade, you'll need to perform a Swing Migration, which involves setting up the new server alongside your existing infrastructure and gracefully 'swinging' resources from one server to another.

Even if you're not planning on upgrading to the latest release of SBS when it is released, the same process can essentially be used to migrate to a Windows Essential Business Server (codenamed Centro) or native Windows Server 2003/2008 infrastructures. Swing migration techniques can also be used in disaster-recovery scenarios. This guide assumes you are planning on installing SBS 2008 on fresh hardware. It's also possible to have SBS 2008 running on the same server in place of SBS 2003, but in order to accomplish this goal, you'll require a 'migration server' and you'll have to perform two 'swings' — one which replicates your existing SBS on the migration server and the second that cuts you over to SBS 2008 on the original server.

One final note: the steps in this article have been written using a beta release of SBS 2008. Some migration tools are supposed to be provided with the RTM version of the product, which may make the process of migration simpler. This article describes how to perform the process manually, though some minor adjustment to these instructions may be required come release date.

### MIGRATION OVERVIEW

The swing migration can be performed in the following phases:

**Phase 1: Preparation** — this involves performing thorough backups of your data and making hand-written notes about various elements of your existing infrastructure.

**Phase 2: Swing Out** — this involves migrating your AD resources to an incomplete installation of SBS 2008 and transferring master roles to the new server.

**Phase 3: Complete Setup** — this involves completing the installation of SBS 2008 components and migrating Exchange mailboxes to your new server along with other shared network resources.

**Phase 4: Decommission** — this phase goes through the steps to gracefully decommission your old server back to a member server.

These instructions allow you to swing out to a new server. If you wanted SBS 2008 running on the original server, you'll need to jump back up to Phase 2 to swing back.

### BE PREPARED

Before you get started, you should ensure that your SBS2003 server is completely up-to-date with all of the latest security patches and service packs installed. Once you've done this, perform a full backup of all data including an online backup of all Exchange databases — just in case disaster strikes while you're performing the migration.

In addition to a regular backup, also perform an offline backup of Exchange databases as an extra precaution. In general, this can be done by simply stopping all Exchange services on your

Not your Avon catalogue: your new server needs to be set up as a Global Catalog server to ensure that it gets a copy of the entire directory partition of your AD.

The image shows two overlapping Windows Server 2008 configuration windows. The 'Add Roles Wizard' is in the foreground, displaying the 'Select Server Roles' screen. It lists various roles with checkboxes, including 'Active Directory Domain Services (Installed)' and 'Global Catalog'. The 'NTDS Settings Properties' dialog is open over it, showing the 'General' tab with fields for 'Description', 'Query Policy', and 'DNS Alias', and a checked 'Global Catalog' option. A note at the bottom of the dialog states: 'The amount of time it will take to publish the Global Catalog varies depending on your replication topology.'

After your base OS installation, install the Active Directory Domain Services role to start your AD migration.

server and making a copy of the MBDATA directory (typically located under the Exchange directory in Program Files).

After your backups have been run you need to extend your AD schema to allow for the installation of a Windows Server 2008 domain controller. Insert the SBS 2008 media and bring up a command prompt. Change your working directory to sources\adprep on your CD/DVD drive and execute the following two commands:

```
adprep /forestprep
adprep /domainprep
```

The swing migration process should seamlessly bring across all user accounts, groups, computer memberships, group policies, SAM and SID references, profiles and login scripts, among other things. However, the process doesn't migrate absolutely everything and, as a result, you should make a note of the following items from your existing server before going further:

Server Settings — including FQDN name, NetBIOS name, and Administrator account name and password.

Network Settings — including IP addresses, subnet masks, default gateway, DHCP configuration (scopes, exclusions, reservations

and option preferences), DNS and WINS server resources and configuration.

File System Settings — including drive letters assigned per volume, root folder permissions and disk usage statistics.

Exchange Settings — including organisation name, site details, storage group names, information store names, email domains hosted by Exchange, POP3 connector mailbox details, alternate email proxy addresses per mailbox and the server's public host name (and any masqueraded aliases).

Shared Folder & Printer Settings — including share names, share descriptions, share permissions and the linked folder/printer location.

After collating all of these details, you're ready to start your swing migration. Throughout the migration, you must remember two things:

Always ensure that the DNS settings for ALL servers are valid and correct at every step.

DNS settings will need to change at various times throughout the migration. If they are not changed at the correct time, the migration will fail.

#### COME OUT SWINGING

As mentioned in Part 3 of this series, an installation of SBS has two phases — the

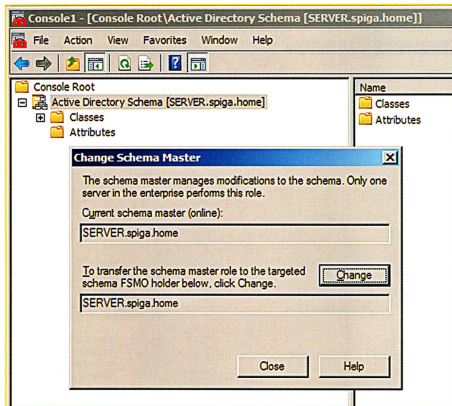
installation of the underlying OS (which in this case will be Windows Server 2008) followed by the SBS components. The first part of the swing migration involves installing the OS component but cancelling the remainder of the installation before the SBS components are installed. This will allow you to migrate your existing AD to the new server instead of creating a new AD forest. Once the AD migration steps have been completed, we will then resume installing the SBS components.

Once you have your base OS installation on your server, do not activate it at this time — it's a good idea to delay activation until after you have completely finished the migration in case something does go wrong and you need to re-install the OS again.

Before commencing your AD migration, open up the Computer Management applet. Check the Event Log to ensure that there are no urgent items that require attention and check Device Management to ensure that all relevant drivers have been installed on your server.

Next, manually configure your primary network adapter with a static IP address that is on the same subnet as your existing SBS 2003 server and DNS server settings pointing to the IP address of your existing SBS 2003 server. Verify that you can ping your existing SBS server by its





▶ **The hidden Schema master: the Active Directory Schema snap-in is only available after you have registered a specific DLL with your Windows installation.**

on your domain though, you'll need to right-click on Active Directory Domains and Trusts in order to manually select the Connect to Domain Controller and Operations Masters options.

Finding the option to transfer the Schema Master role is tricky — you need to execute the following command to register the Schema Master Tool as an MMC snap-in:

```
regsvr32 schmmgmt.dll
```

Next, click Start > Run > mmc. Once the Microsoft Management Console has loaded, click File > Add/Remove Snap-In and add the Active Directory Schema snap-in to the console. When the snap-in has been added, you can Connect to (your new) Domain Controller and change the Operations Masters as you did above.

Once these roles have been transferred, you are technically in violation of the EULA for SBS 2003 (which states that all master roles should be assigned to the SBS 2003 server). It's worthwhile keeping in mind that you have a grace period of seven days to run two SBS servers side-by-side in the same AD domain. If you run SBS Server 2003 R2 or SBS Server 2003 Premium, this can be extended to 21 days by following the instructions in Microsoft Knowledge Base article 943494.

#### NOMADIC DATA

It is at this point that you can resume the installation of the SBS components and then commence migrating other data to the new server. Re-initiate the installation of the SBS components by inserting the SBS 2008 installation media on the new server and letting autorun do its thing, or by running SBSSetup.exe.

Once all SBS components have been installed you'll need to add a new routing group to get mail flowing between your two Exchange Servers while you are migrating mailboxes from the old to the new server. On your new server, load up Exchange Management Shell and execute the following command:

```
New-RoutingGroupConnector -Name "Interop  
RGC" -SourceTransportServers "new_server.  
internal.lan" -TargetTransportServers "old_  
server.internal.lan" -Cost 100 -Bidirectional  
$true -PublicFolderReferralsEnabled $true
```

To test that the routing connector has been configured correctly, create a new mailbox on the new server and attempt to send an email from an Exchange 2003 mailbox to the new mailbox and vice versa.

Once you've verified that mail is flowing

FQDN (ie. server.internal.lan) and that you can also ping the domain name itself (ie. internal.lan). Both pings should resolve to the same IP address — that which belongs to your existing server.

Next, join your server to the domain from within the System applet in Control Panel. Once you have successfully joined the domain, reboot your system and log in this time as the domain administrator. Synchronise your new server's clock with the existing server by running:

```
net time /domain:<internal.lan> /set
```

It's now time to promote your new server to act as a domain controller. To do this, add the Active Directory Domain Services role from within Server Manager (doing so should also install the DNS Server role). You'll need to add this server as an additional domain controller of an existing domain. Once this role has been added, restart your server again.

After you've logged back on to the server, set the new server to be a designated Global Catalog Server by loading up the Active Directory Sites & Services applet from within Administrative Tools and navigating to Sites > <site\_name> > Servers > <server>. From there right-click on NTDS Settings and select Properties. Next, tick the Global Catalog checkbox and click OK and restart the server once again.

After the server has rebooted, log back on

again and load up the DNS applet from within Administrative Tools. Verify that all DNS zones and records have been propagated from the existing SBS Server (use the DNS applet on the existing SBS server as a basis for comparison). Once all records have been copied across, adjust the DNS server settings on the primary NIC of the new server to point to 127.0.0.1 instead of the existing server.

Your next task is to transfer all Operation Master Roles to your new server. To do this, open up the Active Directory Users and Computers applet from under Administrative Tools on the new server, right-click on your domain name and select Connect to Domain Controller. In the ensuing window, select your new server and hit OK. Right-click on your domain name again and select Operations Masters this time. Under each of the three tabs, click on the Change button in order to assign your new server as the master for the RID Master, PDC Emulator and Infrastructure Master roles. When transferring the Infrastructure Master role, you'll receive an additional warning stating that Global Catalog servers should not have this role. While this is the case with larger, native Windows domains, it is acceptable (and required) in single-server domains such as those frequently used with SBS Server.

The Domain Naming Master role is changed from within that Active Directory Domains and Trusts applet and the process is almost identical to the previous three roles — instead of clicking

between both servers, you can start migrating mailboxes across. There is a wizard within the Exchange Management Console that will allow you to do this. Once the console is loaded, the wizard is accessible under Recipient Configuration > Mailbox. Because each mailbox is taken offline while it is being migrated, it's a good idea to schedule the Move Mailbox task to occur outside of business hours using the wizard.

In addition to moving mailboxes, you'll also need to move the Public Folder content from the old server to the new, configure Exchange 2007 to generate all Offline Address Books, remove the Mailbox and Public Folder stores from the old server, and verify that your new SBS server is transporting email successfully in and out of the organisation before you can decommission your old Exchange Server. Detailed instructions on how to perform these tasks can be found at [http://technet.microsoft.com/en-us/bb288905\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/bb288905(EXCHG.80).aspx).

On the network services side of things, you can commence moving the DHCP database from the old server to the new by running the following command on the old server:

```
netsh dhcp server export c:\dhcp.txt all
```

Then, stop and disable the DHCP service on the old server and copy the C:\dhcp.txt file to the root directory on the C drive of your new server and then run:

```
netsh dhcp server import c:\dhcp.txt all
```

Copying the data from your old server to the new can be achieved in one of two ways — you can either restore the data from backup or you can use a tool such as robocopy (the Robust

Copy Utility) to synchronise the data between your servers. If you choose to take the latter option, download the robocopy GUI from <http://technet.microsoft.com/en-us/magazine/cc160891.aspx> to your new server (the robocopy utility should be installed by default on any Vista or Server 2008 installation). The GUI makes it simpler to copy data and associated metadata and permissions in a simple operation. Once the data has been copied across, be sure to set up the required file and printer shares on the new server.

#### DECOMMISSIONING

The first step in decommissioning your old server is to remove Exchange. As mentioned above, you'll want to ensure that your new

old server. You can do this by running the following on the new server:

```
netdom computename <new_server_name> /  
add:<old_server_name>.<internal.lan>
```

Then navigate to the HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\lanmanserver\parameters key in regedit and create a new DWORD value named DisableStrictNameChecking with a value of 1. Restart the server and the alias will be created.

The final step of the migration is to demote the old server so that your new SBS server is the sole domain controller for your infrastructure. To do this, run dcpromo on the old server. Ensure that you do not select the option titled 'This



## KEEP IN MIND THAT YOU HAVE A GRACE PERIOD OF SEVEN DAYS TO RUN TWO SBS SERVERS SIDE-BY-SIDE

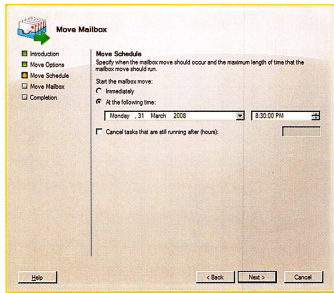
server is looking after all mail transfers and that you have no Mailbox or Public Folder stores on the old server before uninstalling Exchange. Once you are certain that this instance of Exchange is bare, load up the Add/Remove Programs applet in Control Panel, select the Windows Small Business Server 2003 option and click on Change/Remove. In the Action column of the Component Selection screen, select Remove for the Exchange Server option. You'll need to supply your SBS 2003 media to complete the uninstallation.

Next, create an alias that maps the old server name and points it to the new server — just in case you have any applications that are running on your infrastructure that statically refer to the

server is the last domain controller in the domain'. After demotion, the server will revert to being a new member of the domain. You can then switch off the server and retire it in a couple of weeks once you're certain that you won't require additional data from the server.

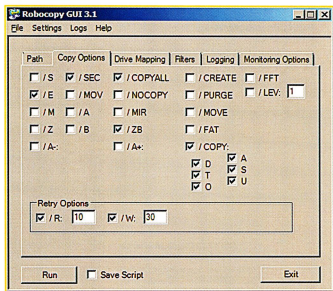
#### FINAL WORDS

An extremely detailed swing migration toolkit is available from Jeff Middleton, an SBS MVP, at [www.sbsmigration.com](http://www.sbsmigration.com). At US\$200, the technician's kit contains everything that you could want to know (including how to recover from scenarios where things go wrong), covers significantly more scenarios than this article could and is great value for money. [GITEE](#)



**Moving schedule:** in order to minimise the impact on staff, you can schedule mailbox moves after business hours.

**Preserving security:** the robocopy options shown will ensure that all security metadata is copied along with the data.





# workshops

HANDS-ON WITH HARDWARE AND SOFTWARE

HARDWARE

SOFTWARE

GADGETS

## Fix and tweak RAM

If you want a fast PC, huge amounts of memory isn't the whole solution, says **James Morris**.

### REQUIREMENTS

#### • A PC

Any system will do, as they all need RAM. However, the amount of optimisation flexibility will vary greatly with your motherboard chipset, model and BIOS.

#### • ANTI-STATIC WRIST STRAP

Not a necessity, but if you want to reduce the risk of damaging sensitive PC components with your natural body voltages, attach an anti-static strap to your wrist and earth it against a ground-attached nearby metal object.

### IN THIS SERIES

#### • July '08 – Hard disks

To get the best from your hard disk, it isn't just a matter of plugging it in and praying. There are rules, arts and secrets to be learned.

#### • August '08 – Processors

If you're after the best system performance, you'll need to delve into the black arts that surround processor installation and configuration.

**O**ver the next three issues, we will explain how to ensure your PC's memory, hard disk and CPU are installed correctly and configured for optimum performance. This month we begin with the main memory, which very much works hand-in-hand with the processor. If this is slow, the CPU can be left twiddling its electronic thumbs, wasting the money you have spent on a fast model. One of the best ways to get a bit more life out of any PC is simply to install more memory, but there are lots of other memory features which are also very important to consider. So long as your PC isn't too cramped inside, installing memory isn't difficult. You do need to be a bit more careful about static electricity, so an earth-connected wrist strap is worth getting hold of. When inserting the memory (assuming you bought the right type for your motherboard), first flick back the little holding clips and ensure the notch on the module is in the right place for the tab on the slot. This is nearer one side, and if the memory won't fit either way round, you've probably got the wrong memory for your motherboard. Don't force it in, as that will cause damage to the memory, motherboard or both.

#### MATCH YOUR MEMORY

Make sure you always install memory as matching pairs, in the correct slots. Virtually all motherboard chipsets now use memory

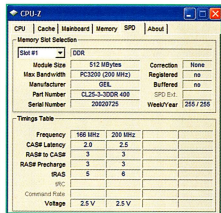
interleaving, where data is split into chunks and then written and read to twin modules at once. This theoretically doubles the throughput, so not using it can have a negative effect on system performance. Memory should be installed in pairs, with one each in the appropriate bank for the two channels. Usually, this means installing it in alternate slots, but it's always worth consulting your manual. Some motherboards only offer two memory slots, so if you increase memory by replacing one module, you'll lose the performance of interleaving memory. In this case, you will have to entirely replace your existing memory.

#### KNOWING YOUR MEMORY

There are now three main types of memory in widespread use within PCs from the last three years. All of these include their own performance-multiplying technology, and this is the main distinguishing factor. Older AMD Athlon 64s, and even older Intel Pentium 4 chipsets, use DDR — which is SDRAM employing clock-doubling. More-recent Athlon 64s, most Pentium 4 chipsets and all but the most recent Core 2 chipsets use DDR2, which is SDRAM with clock-quadrupling. The newest Core 2 chipsets from Intel support the relatively new DDR3 memory, which doubles data rates once again, so it is operating on an external clock eight times that of the internal DRAM chips. None of these memory types are backwards-



MSI's X38 Diamond offers a good range of RAM timing options when you choose not to use the SPD.



▲ CPUID's CPU-Z will tell you everything you need to know about your system's memory.



compatible; so you have to get the right memory type for your motherboard. However, there are also features like ECC, buffering and registered configurations to consider. Most mainstream motherboards don't require any of these, although the very first AMD Athlon 64 FX systems did, as do Opterons. The notch is in a slightly different place with these memory types, so you shouldn't physically be able to install them in a motherboard without the correct support.

Beyond the basic memory type comes the rating of the memory modules themselves, and this is where the price differentiation is primarily focused. The most frequently quoted specifications are the clock frequency and throughput PC rating, expressed as MHz and MB/sec respectively. So, for example, PC2-6400 DDR2 runs at 800MHz externally and can shift data at 6,400MB/sec — or 12,800MB/sec in the usual dual-channel interleaved configuration. The higher the rated frequency and throughput numbers, the faster the memory. So one way of improving your PC's performance is installing faster-rated memory, but there is a catch.

Most motherboards officially support a certain performance level, although it's almost always possible to run memory faster than the specification. However, this requires manually tweaking the settings. By default, the motherboard BIOS will refer to the standard settings for the memory, which are stored in 128-bytes of EEPROM on the module itself. The system used is the JEDEC standard called Serial Presence Detect (SPD); this tells the motherboard how the memory is rated and what timings to use.

The timings for a memory module are expressed as four numbers, such as 2-2-2-5 or 8-8-8-18. The lower the better, as they dictate how many clock cycles it takes for the memory to start fulfilling a data request. But, as memory has become faster, it has been necessary to relax the access timings to maintain stability. So where the fastest DDR SDRAM takes as little as two clock cycles to execute a data request, the fastest DDR2 takes four and DDR3 at least seven. This is outweighed by the enhanced throughput as new memory types get faster, but when a new type of DDR first arrives it can often be slower.

CMOS Setup Utility - Copyright (C) 1985-2005, Inc.	
Cell Menu	
Current CPU Frequency	2.66GHz (333MHz)
Current DRAM Frequency	1067MHz
D.O.T. Control	
Intel EIST	(Disabled)
Adjust CPU FSB Frequency	(300)
Adjust CPU Ratio	(7)
Adjusted CPU Frequency	(2667)
Advance BIOS Configuration (Press Enter)	
FSB/Memory Ratio	(1:2.00)
Adjusted DRAM Frequency	(1520)
Adjusted PCI-E Frequency	(100)
Adjusted PCI Frequency	(33.3 Mhz)
Auto Disable DRAM/PCI Frequency	(Enabled)
CPU Voltage	(Auto)
Memory Voltage	(Auto)
Tab: Move Enter: Select +/-: Value F10: Save F6: Load Optimized Defaults	

#### CHECKING YOUR SETTINGS

You can check the current configuration of your memory using the CPU-Z utility ([www.cpuid.com/cpuz.php](http://www.cpuid.com/cpuz.php)). Unless you have already been fiddling in your motherboard's BIOS, newly installed memory should have its settings configured automatically by SPD. This will



## VIRTUALLY ALL MOTHERBOARD CHIPSETS NOW USE MEMORY INTERLEAVING: THIS THEORETICALLY DOUBLES THROUGHPUT

guarantee stable operation. However, you could get extra performance if you're prepared to experiment.

Tweaking memory is trial and error — there are more variables to consider than with processors. With higher-quality memory, you can increase the voltage by a few 0.1V increments above the stock setting, allowing you to either reduce the timings, or increase the frequency of the memory. You may be able to reduce the four

MSI's Cell overclocking lets you tweak the DRAM Frequency with FSB speed and FSB/Memory ratio.

timings by one or two units. Change one setting at a time, then boot into Windows and run an intensive benchmark like 3DMark06 to see if everything is stable (and faster).

When tweaking the last of the four timing numbers (tRAS), ensure that the value chosen is at least equal to the first two plus two. So if you set both CL and tRCD to 5, tRAS should be at least 12. You will find if you have set tRAS too low, memory errors and system crashes will happen.

You can get more performance by increasing the clock frequency, but this is quite complicated. The memory clock is linked to the CPU, either by the Front Side Bus speed (with Intel processors) or because the memory controller is actually inside the CPU itself (with AMD processors). So memory overclocking is often a two-stage process of overclocking this bus in the CPU overclocking section of the BIOS, and then applying a multiplier/memory divider to achieve the required speed. Aside from increasing voltage to keep the higher clock stable, it's often also necessary to increase the four timing numbers to keep things stable.

This will increase the frequency ceiling and usually results in faster performance.

Tweaking your memory doesn't usually end up with the huge performance benefits got from processor overclocking. It could take a couple of days to get a great performance. Make sure you know where your motherboard's CMOS reset switch is, so you can recover if you come up with a configuration that won't even POST; remember to back up any important data too. [bit.ly](http://bit.ly)

### DO THIS... TRY XMP

Finding the highest reliable settings for your hardware can be a time-consuming and hit-or-miss affair. When so much hardware can clearly run well above the standard specification, however, it seems almost rude not to make use of the extra potential. First Nvidia created SLI Memory. Now Intel has got together with memory and motherboard manufacturers to create a performance setting

that is guaranteed to work with its chipsets.

Called Extreme Memory Profile (or XMP for short), it's currently only available with select Intel P35 and X38 chipset motherboards (mostly X38) and with X48. It also currently only supports DDR3, not DDR2. Like EPP, XMP goes beyond the JEDEC SPD settings to include many more memory settings, such as voltage and many other performance-

tweaking details. The potential benefits are great. For example, Corsair's DDR3 1,800MHz CAS 7 Dominator is guaranteed to run at 1,800MHz with 7-7-7-20 timings, using a 2V supply, and at 1,900MHz with CAS Latency set to 8. On a compatible motherboard, you could be getting close to 50 per cent extra memory bandwidth over regular 1,333MHz memory.



# Powerful Linux Intranet

Take control of your home network and create your own content.

Graham Morrison shows you how.

## REQUIREMENTS

### ● AN OLD COMPUTER

It doesn't need to be old, but the system requirements for this setup are very modest.

### ● UBUNTU 6.10 LTS

We used this as it has a single LAMP installation option, but these instructions should work with most other Linux distributions.

## INSIDE INFO

- As you can imagine with a web technology like WordPress, there are hundreds of internet sites that are designed to help bloggers get the most out of their installation. You've already done the hard part, but if you want to take your server further, try adding a twitter plug-in (so you can update your intranet from your mobile phone) or a wiki that your household can use to keep contact information up to date. The first place to go for any help with installation and configuration in WordPress is their excellent forums: <http://wordpress.org/support/>.

WordPress is one of the most extensible blogging servers you can run, and it doesn't need to be restricted to simple blog posts.

**B**uilding a private network is simple if you follow our step-by-step guide. We'll show you how to create a home intranet using some old PCs and Linux.

## STEP 1: HARDWARE

We will start by choosing the computer that's going to be connected to the same network as all the other devices. Horsepower is an important consideration here — you should use a machine you have in semi-retirement, as it doesn't have to be powerful. Serving a few web pages to a few machines requires hardly any memory or CPU cycles, which means you could easily get away with a Pentium III class machine with 256MB of RAM. The size of the hard disk will depend on how much data you want to store. The good news is older machines still work with newer drives; you'll just need to make sure you're using the same interface. This will likely be IDE rather than the newer SATA. You may already have a machine running on a local network that you could use. If you use a machine as a NAS, secure router or home server, then adding intranet functionality to these machines is the best way forward.

The machine needs to be connected to the same network as the devices you're going to be connecting from. A good idea might be to use one of the wired RJ45 connections you typically find on a wireless router. The downside to this approach is that your intranet server will need to be near the router, but there are two advantages. First, you won't need an expensive

wireless card for the server, as you can use the built-in Ethernet you will find embedded in the rear connector of the vast majority of machines. Secondly, your wireless bandwidth won't be used when no one is connecting to the router. If you have lots of devices needing space on your WLAN, every machine not on the network will leave more room for the others.

## STEP 2: SOFTWARE

The heart of the intranet is the web server. This is the software responsible for serving the pages to those machines that request them. The most common web server used on the internet is Apache, a free piece of software that's a flagship of open-source development. You can install Apache on any modern operating system (including Windows), but Linux is often the best option because it's also free. No one wants to spend money on a machine hiding in a cupboard, but the Unix-like environment that Linux offers is much better suited to Apache configuration, which is emulated within Windows. Another advantage to using Linux is that Apache is nearly always bundled by default, and so are the applications and tools that go along with a typical installation. Ubuntu is probably the best example of this. For our installation, we're going to use a version of Ubuntu developed specifically for servers. This version is called the Ubuntu Server Edition and it differs from the desktop edition in several ways. It doesn't include a Live CD installer, it's based on an older version of Ubuntu, it's supported



There doesn't seem to be a `wp-config.php` file. I need this before we can get started. Need more help? [We got it.](#) You can create a `wp-config.php` file through a web interface, but this doesn't work for all server setups. The safest way is to manually create the file.

### WordPress

Below you should enter your database connection details. If you're not sure about these, contact your host.

Database Name	wordpress	The name of the database you want to run WP on.
User Name	wordpress	Your MySQL username.
Password	wordpress	Your MySQL password.
Database Host	localhost	99% chance you won't need to change this value.
Table Prefix	wp_	If you want to run multiple WordPress installations in a single database, change this.

### WordPress

Welcome to WordPress. Before getting started, we need some information on the database. You will need to know the following items before proceeding.

1. Database name
2. Database username
3. Database password
4. Database host
5. Table prefix (If you want to run more than one WordPress in a single database)

If for any reason this automatic file creation doesn't work, don't worry. All this does is fill in the database connection to a configuration file. You may also simply open `wp-config-sample.php` in a text editor, fill in your information, and save it as `wp-config.php`.

for a longer period of time (five years, as opposed to three for the desktop edition), but most importantly, you can have a working web server, from installation to completion, in less than 15 minutes. This is because there's a simple installation option from the boot menu that will create a LAMP server from your machine. LAMP — the combination of Linux, Apache, MySQL, and PHP — is one of the driving forces behind the whole web 2.0 revolution. You might think a cutting edge server installation is overkill for your home intranet, but this is the same technology that's used by many modest wiki and blog sites, which is exactly what we need for our intranet. After selecting 'Install LAMP Server' from the boot menu, answering a few questions about your location and how you'd like to partition the hard drive, as well as creating a user account on the new machine, you'll find yourself with a working web server installation. If you want to create a LAMP server on Windows, see the next workshop on page 103.

### STEP 3: CREATE CONTENT

Now that your web server is running, the first thing you should do is check it's working. You

can do this from any of your gadgets attached to the same network as the server. You need to point them at your server's IP address to find a simple directory listed containing the Apache text page. You can find the IP address either from the router that the server is connected to or by logging into the server and typing 'ifconfig'. We now need to add our content. This is the blank palette we mentioned earlier, and there are many ways of proceeding from this point. You might want to create your own content, perhaps hand crafting the web pages by hand, or by using Microsoft Word or Adobe Dreamweaver to generate the pages for you. In these cases, you will need to put the generated HTML files in the `/var/www` folder on your server. They will then become the home page for any browser that's pointed at the IP address of your home server.

However, hand crafted HTML isn't the way to go for the 21st century fridge door. What we need is dynamic content, and a system that anyone can use without web-building skills. If this was the company intranet we'd implement a CMS, but for the home we need something a little less prosaic, which is why we've opted to

use one of the most popular pieces of blogging software available — WordPress. A blog might not seem like the obvious choice for a virtual recreation of a notice board, but they're very flexible. The bulletin nature of the news posts is perfect for family updates and scraps of information, as is the distinction between different users of the same blog. The blogging software we're going to install, WordPress, can be extended in all kinds of ways, and users of your home intranet will be able to customise almost every aspect of their blog.

### STEP 4: WORDPRESS INSTALLATION

On the Ubuntu server, log in and type 'sudo bash' to open a new shell with system administrator privileges (you'll be asked for your password). Now type 'nano/etc/apt/sources.list'. This opens a small, console-based text editor, and the file we've loaded into it is the sources list for the application installation system used by Ubuntu. You need to uncomment the two lines pointing to 'dapper universe' — uncomment them by removing the two # symbols at the beginning of the line. When you've finished, press Control+x to exit and select 'Y' to save your

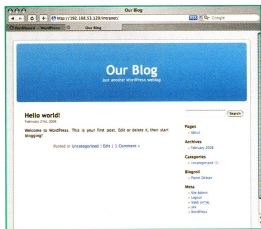
## SPOTLIGHT ON... CUSTOMISE WORDPRESS

The best thing about WordPress is that it's completely customisable. You can change virtually everything about it. When you log in as administrator, switch to the 'Presentation' tab, for example. From here you can switch between any available themes for your blog, which will completely change the appearance and layout of your intranet. By default, there's only one other theme included with WordPress, but you can easily install more. There are many sites that provide themes you can install, with one of the most popular being <http://themes.wordpress.net>. When

you've found one you like, download the zip file to your server. You can do this on the server itself by using the `wget` command, followed by the complete URL of the theme you want to download. Most themes are pre-packed as zip files and these will need to be uncompressed. Ubuntu Server doesn't include `unzip` by default, so you will need to install this by typing 'apt-get install unzip'. `Unzip` will create a folder with the name of the theme, and this needs to be moved to `/usr/share/wordpress/wp-content/themes/`, after which it will appear in the 'Presentation' window.

Selecting your theme here will change the look of your blog; and you can even hand-edit any elements in the theme you don't like. If you want to add new widgets to your blog layout, including photos and calendars, you need to switch to the 'Plug-ins' tab in the WordPress admin window. From here you can activate any included plug-ins, as well as enable any you may have downloaded and installed. Like themes, plug-ins are downloaded in the same way, they just need to be placed in the `/usr/share/wordpress/wp-content/plugins/` directory before being listed and activated.





Once everything is running and configured, you will find a blank WordPress template waiting to be used as your home intranet.

The only other information required by the installation is a name for the blog and an email address for the administrator.

changes. Now type 'apt-get update' to download the new package list from the universe server we've just added. WordPress can now be installed by typing 'apt-get install wordpress', but we still need to configure and run the server.

WordPress uses Apache, MySQL and PHP, making it the archetypal LAMP application. We first need to create the MySQL database that WordPress is going to use for its content. From the same command-line we used to install WordPress, type 'mysql -u root -p' to log in to the MySQL server. A default installation doesn't set a root password for MySQL, so you might want to change this. Now type 'CREATE DATABASE wordpress;' to create the WordPress database. The last step in MySQL is to create a user that will access this database. You can do this by typing:

```
GRANT ALL PRIVILEGES ON wordpress.* TO
'username'@'localhost' IDENTIFIED BY
'password' WITH GRANTOPTION;
```

This grants local access to 'username' using 'password' to the WordPress database. We now need to tell Apache that WordPress has been installed and where to find it. Type exit to leave MySQL followed by 'nano/etc/apache2/apache2.conf' to open Apache's configuration file and add this to the bottom of the file:

```
Alias /intranet /usr/share/wordpress <Directory
/usr/share/wordpress> Options FollowSymLinks
AllowOverride Limit Options FileInfo
```



#### First Step

Before we begin we need a little bit of information. Don't worry, you can always change these later.

Weblog title: **Our Blog**  
Your e-mail: **bloghome@localhost**

Double-check that email address before continuing.

[Continue to Second Step >](#)

DirectoryIndex index.php <Directory>

This is specifying where our blog will be located on the running web server (we used '/intranet', and where the files are located on the hard drive (/usr/share/wordpress). This causes a problem with Ubuntu because it has forced its Debian standard location for the WordPress installation, which is actually split between '/usr/share/wordpress' and '/etc/wordpress'. To solve this problem, type 'cp /etc/wordpress/htaccess/.usr/share/wordpress/' to copy the web access permissions file, then remove the '/etc/

chmod 750 /etc/wordpress

rm /usr/share/wordpress/wpconfig.php

Now restart both the Apache and MySQL servers, either by restarting your machine, or by typing '/etc/init.d/mysql restart' and '/etc/init.d/apache2 restart'. Now point a web browser at 'http://myserver/intranet/wpadmin/install.php', changing 'myserver' to reflect your server's IP address. The page that loads will inform you that there is no wp-config.php file, which is because we deleted it earlier; you can click on the 'create a link' to create one — just enter the database



## THE HEART OF THE INTRANET IS THE WEB SERVER: THE SOFTWARE RESPONSIBLE FOR SERVING THE PAGES

wordpress' directory with 'rm -rf /etc/wordpress', and finally link the remaining directory to the position of the old one: 'ln -s /usr/share/wordpress/etc/wordpress'. We now only have a single location for the WordPress installation. We then need to change the permissions on this directory so only the web server can access it — and remove the empty WordPress configuration file:

```
chown -R www-data:www-data /usr/share/
wordpress
```

name, along with the username and password you used in the MySQL prompt. After this has completed, you'll move on to the installation script proper. This consists of two steps, the first asking for a blog title and an email address, while the second will tell you a login name 'admin' and a password to go along with it. You're now finished! Click on the 'login' link and you're in your new blogging environment, running on your own intranet. Here, you can create new accounts for your family, add posts and change virtually anything in WordPress using hundreds of available plug-ins. [BETA](#)

### DO THIS...

### GET A PORTABLE WEB

The internet has permeated our households. We used to have a single desktop PC for everything, but these days, many of us have more than one machine. If you start to include hardware that features its own web browser, you could find yourself with more than half a dozen web-aware devices in your home. Mobile phones, the Playstation Portable, the Nintendo DS, the Wii, Microsoft's 360, Sony's Playstation 3, and even several set-top boxes and digital televisions,

each have their own embedded web browsers. While these browsers are useful, you can add some serious functionality for yourself if you change their default homepage to something a little more personal, and this means running your own intranet. An intranet might seem a little prosaic for the home — they're normally associated with work and the office, but there's no rule to say they need to be corporate, self-serving and boring. By building a simple web server,

installing some free content management software and using this as a new homepage for your home-based browsers, you can create the virtual equivalent of the family fridge door, the place where anyone in the household can leave information, notes, diaries, music and photos for anyone else on the same network to see. With a blank palette, there's no reason why a home intranet should look anything like your work intranet.

# Web development server

Robin Nixon shows you how you can create a WAMP (Windows, Apache, MySQL & PHP) setup directly on your own PC.

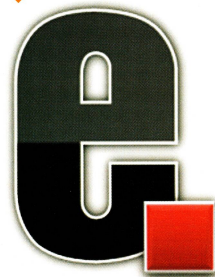
## REQUIREMENTS

- **A PC WITH 1GB RAM**  
This can be running either Windows XP/Vista.
- **EASYPHP**  
Available for download at [www.easyphp.org](http://www.easyphp.org).

## INSIDE INFO

- PHP web site  
[www.php.net](http://www.php.net)
- MySQL web site  
[www.mysql.com](http://www.mysql.com)
- Apache server web site  
[www.apache.org](http://www.apache.org)

EasyPHP — remember to test your installation when complete.



Before using EasyPHP, you have to create a directory for your project files — in this case the directory and alias of web\_development are used.

**W**hen developing for the internet using PHP and MySQL, but without your own development server, you have to upload every modification you make to a server on the web before you can test it. Even on a fast broadband connection, this can still represent a significant slowdown in development time because, if you think about it, even a small upload delay plus the time taken to locate your FTP program and drag and drop the relevant file(s) comes to maybe 30 seconds or more per modification for each.

So, if you need to test your code up to 50 times in a session, you may have lost up to half an hour out of your work day. However, on your own PC it can be as easy as saving an update (usually just a matter of clicking once on an icon) and then hitting 'Refresh' in your browser.

## SAVE TIME WITH WAMP

Once you have your own development server you'll wonder how you ever managed without one, and it's easy to create. Just follow the simple steps in this Workshop. WAMP is one of those contrived acronyms that seem to thrive in the field of computing. It stands for Windows, Apache, MySQL and PHP, and describes a fully functioning setup used for developing projects.

Possibly the easiest WAMP system there is comes in the form of a package called EasyPHP. Not itself a program, EasyPHP is more of a framework binding the other programs together so that you don't have to separately install and set them up. It also makes it easy to start and stop the services from one control window, while the various admin screens for each program are also brought together in a single location. You could download all the parts separately and create your

own WAMP, but why go to the effort when EasyPHP does it all for you? Here's how you use it.

## DOWNLOAD AND INSTALLATION

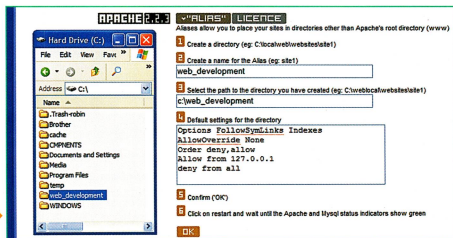
Follow the download link at the top-right of the EasyPHP web site ([www.easyphp.org](http://www.easyphp.org)) and you'll be taken to the SourceForge download area. The version used in this workshop is 'EasyPHP-2.0b1-setup.exe' and it's about 13.5MB in size. When you run the installer, just follow the prompts and accept the defaults given. Upon completion, EasyPHP will load and an icon will be added to your System Tray. Double-click on the icon and the control window will pop up where you can start, stop and restart both Apache and MySQL. We have noticed that sometimes the initial installation will not correctly start one or the other program, so, if you don't see a green traffic light next to one, select 'Restart' to get it going.

## TESTING THE INSTALLATION

The first thing to do at this point is verify that everything is working correctly. To do this, enter the following text into your browser: **http://127.0.0.1**. This is the IP address the computer uses to refer to itself, if you prefer you can use the alias: **http://localhost**.

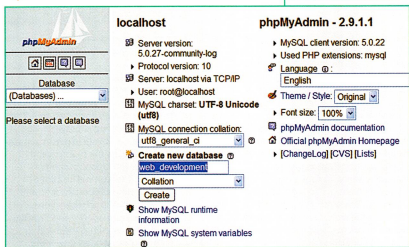
This does the same job as the previous code. All being well, you will see the default screen returned by the phpinfo() function. If you're new to managing web servers, don't worry about the plethora of information shown here — you can safely ignore it. As long as the information is there, that's all that matters for now.

Assuming you have been successful so far, you now need to perform one more task in order to have your development server fully operational.





Instead of using a command line, all your administration needs are done by phpMyAdmin, a utility automatically installed for you by EasyPHP.



To do this visit the following URL: <http://localhost/home>.

Next, click on 'Add' underneath the 'Apache' section. You will now create a hard disk directory and associated aliases for your projects. For example, for the alias type 'web\_development' and for the directory enter 'c:\web\_development' and finally, click on 'OK'.

You will now be able to browse your development directory in your browser by entering the following text: [http://localhost/web\\_development](http://localhost/web_development).

If you will be maintaining several projects, you should take the opportunity to now create the directories you will need and the aliases Apache will recognise. The alias names do not have to be the same as the directory names. For example, if you wish you can have a directory several levels deep aliased simply to a word, for example, 'test'.

## DEVELOPING A PROJECT

When you have your first development directory ready it's time for the obligatory 'Hello World' program to ensure everything is in order. So just create a file called 'index.html' and save it into that folder then browse to the alias you created, if everything has gone according to plan you will

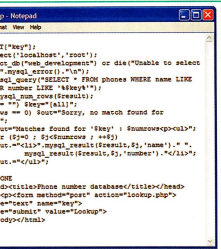
now be viewing your first HTML page.

Now we come to working with MySQL. To illustrate how to do this, we'll build a simple contacts and phone numbers database and retrieval system.

The first thing we have to do is create a new database. In keeping with the naming used so far we'll call it web\_development. All this is neatly accomplished using a built-in version of phpMyAdmin. To use it call up the following location in your browser: <http://localhost/home/mysql>.

Under the section entitled 'localhost' you'll see an input box where you can create a new database, so type in web\_development and click on 'Create'. Immediately your new database will be created and ready to use. As an aside you should note that by default MySQL is set up to allow root access without a password. If you prefer to be more cautious you may wish to change this. Full details can be found in the online documentation.

Next, we need to create a table for our contacts that we'll call 'phones'. So, on the next screen after creating the database we enter 'phones' in the name field and '2' in the number of fields field because we will only be storing



Here we see lookup.php in action returning all the rows in the database after Lookup was clicked on its own.

name/number pairs. Obviously a complete project would contain many more fields such as address, mobile and so on, but two fields are enough for this Workshop.

On the next screen you need to inform MySQL what will be stored in the two fields. For name, a variable character (or varchar) string of up to 64 characters seems reasonable and a varchar string of 32 for the phone number should also suffice. To allow fast searching of the database you should also click the 'Index' checkbox for any fields you wish it to allow you to search. In this instance probably only the name field is required as we'll be unlikely to try and look up a name based solely on a number.

Without the 'Index' checkbox ticked, your database will be smaller, but after it gets to a decent number of entries, searching it will become intolerably slow, so you might as well accept the memory hit and select 'Index' from the start.

## INSERTING DATA

Usually your PHP code will handle the insertion of data into your MySQL tables, but it isn't best the case when you're building a project, because you can enter data directly from phpMyAdmin by

## SPOTLIGHT ON... WAMPS

WAMPS are packages of independently created programs installed on computers that use a Microsoft Windows operating system. The interaction of these programs allows dynamic web pages to be served over a computer network, such as the internet or a private network.

As we said, WAMP is an acronym formed from

the initials of the operating system, Windows and the package's principal components: Apache, MySQL and PHP (or sometimes Perl or Python). Apache is a web server which allows people with web browsers to connect to a computer and see information there as web pages. MySQL is a structured query language database manager (that

is, it keeps track of data in a highly organised way).

PHP is a scripting language that can manipulate information held in a database and generate web pages fresh each time an element of content is requested from a browser.

The equivalent installation on a Linux OS is known as a LAMP.

Inserting data into MySQL is a straightforward task using phpMyAdmin because you simply enter the fields into a ready-made form.

clicking on the 'Insert' tab for the table in question. A ready-made input form will then appear where you can proceed with populating your database with your list of contacts. Simply enter each name in the name field and each phone number in the number field. For test purposes, you should probably enter about half a dozen rows of data here.

The 'Function' selectors for each field should be left blank when you do this. For speed, the selector above the 'Go' button can be set to automatically go back to the 'Insert' screen after each insertion.

At any point, you can verify that your data entry is being accepted by clicking on the 'Browse' tab. You can then view all entries in a table, 30 rows at a time, sorted by any key you choose. You can also edit and delete any rows.

## WRITING THE PHP CODE

With the database set up and populated with data, we are ready to write some code to use it. Firstly, we need a piece of HTML to accept search input and post the search string to the lookup program, so here's 'search.html':

```
<html>
<head>
<title>Phone number database</title>
</head>
<body>
<form method="post" action="lookup.php">
<input type="text" name="key"> <input
type="submit" value="Lookup">
</form>
<body>
</html>
```

This is a very simple and basic piece of HTML, but it's functional for our purposes. What it does is prompt for a search word which it places in the post variable 'key' which is sent to 'lookup.php', which looks like this:

```
<?php
$key=$_POST["key"];
mysql_connect('localhost','root');
mysql_select_db("web_development") or
die("Unable to select database.");mysql_
error();"");
$result=mysql_query("SELECT * FROM phones
WHERE name LIKE '%$key%' OR number LIKE
'%$key%'");
$numrows=mysql_num_rows($result);
if ($key == "") $key="[all]";
```



## WITH THE DATABASE SET UP AND POPULATED WITH DATA, WE ARE READY TO WRITE SOME CODE TO USE IT

```
if ($numrows == 0) $out="Sorry, no match
found for '$key'.<p>";
else {
$out="Matches found for '$key' :
$numrows<p><ul>";
for ($j=0; $j<$numrows; ++$j)
$out="<li>".mysql_result($result,$j,
'name').". ".mysql_result($result,$j,'number').".</
li>";
$out="</ul>";
}
echo <<< DONE <html><head><title>Phone
number database</title></head>
<body>$out<p><form method="post"
action="lookup.php">
<input type="text" name="key"> <input
type="submit" value="Lookup"> </form></
body></html> _DONE;
?>
```

Taking a quick walk through it, we see that 'lookup.php' retrieves the value of 'key' as posted to it and then attempts to establish a connection with the MySQL server at 'localhost' as 'root', and then to select the 'web\_development' database. If any of this fails, the die() function will be called up and the program will conveniently display the appropriate error message. Upon success the database is then queried using the command:

```
SELECT * FROM phones WHERE name LIKE
'%$key%' OR number LIKE '%$key%'
```

This tells MySQL to return all fields in all rows where a partial match to the keyword is encountered. The % either side of \$key acts as a wildcard when used with the LIKE function — this is what gives us our matches for partial results. Also, all matches are automatically case insensitive: one less thing for us to worry about.

The result of the query is returned in the variable \$result, which is then passed to the function mysql\_num\_rows() to see how many matches there were. If none, then the string variable \$out is set appropriately. Otherwise each match is extracted in turn using mysql\_result() and placed in \$out. Finally, there's some HTML that re-displays the contents of 'search.html' but also includes the contents of \$out which are the results of the search we conducted this issue. One side effect of the way this code is written with the wildcards is that simply clicking on Lookup without entering anything to search for will return all rows in the database. If you don't like this kind of behaviour, you can easily catch it by looking for the null string being posted.

## SUMMARY

We've covered the basics of EasyPHP for you in a nutshell. If you experiment with it, there are numerous configuration options and other features, and we never even scratched the surface of configuring Apache, but all that can be left for you to tinker with later because, after all, this is a development server and you can save your tweaking for your production server.

As long as you can quickly and easily test your code locally, that should mostly be all you require for now, and it could save you hours a week if you're a full-time developer. [EJTC](#)





# Make 3D movies and pics

With a little know-how about anaglyphs and some coloured glasses, *Christian Darkin* shows you how your pictures will come alive.

## REQUIREMENTS

### ● DIGITAL CAMERA

Any digital camera will do for stills. If you want to take 3D photos of moving objects, you'll need two identical cameras.

### ● WEBCAMS

Two identical webcams which can both be installed on your PC at the same time without conflicts.

### ● Z-ANAGLYPH

Free software for turning your photos into 3D pictures.

### ● 3DCAM

A package which creates 3D video out of two webcam sources.

### ● 3D GLASSES

A pair of 3D glasses with one red lens and one blue one.

## INSIDE INFO

- A good place to buy a range of different types of 3D glasses: [www.3DglassesShop.com](http://www.3DglassesShop.com)

- As for online images, the Third Dimension Society has a gallery of anaglyph images on their web site: [www.thirddimensionsociety.org/anaglyphs.htm](http://www.thirddimensionsociety.org/anaglyphs.htm)

- The Stereoscopic Society is another 3D photography organisation: [www.stereoscopicsociety.org](http://www.stereoscopicsociety.org)

- There's also a Yahoo group dedicated to sharing and discussing anaglyph images: <http://tech.groups.yahoo.com/group/anaglyphs/>

Using image manipulation software, you can create 3D pictures. Just obey some simple rules to make each shot subtly different.

**T**hree-dimensional movies and pictures are a simple idea that's been with us for decades. Just by putting on a pair of fashionable red/blue glasses, you can bring images out of your flat computer monitor and into 3D. Anaglyph 3D is created by taking two images from two separate cameras. The cameras are placed the same distance apart as your eyes, and the same view is taken. The pictures are then tinted (one blue and one red) and superimposed over each other. When you look at them through similarly tinted glasses, you see each image with a different eye and the object appears to have depth. Put simply, each object in the scene appears twice — once in red and once in blue. If the objects are a long way away, the red and blue images will be directly superimposed. If the objects are closer, the red and blue images will diverge and the 3D effect will be created. Producing your own 3D pictures and movies has become a lot easier. With the massive reduction in the price of digital cameras and camcorders, it's now possible to consider using two identical devices to record 3D pictures or even videos.

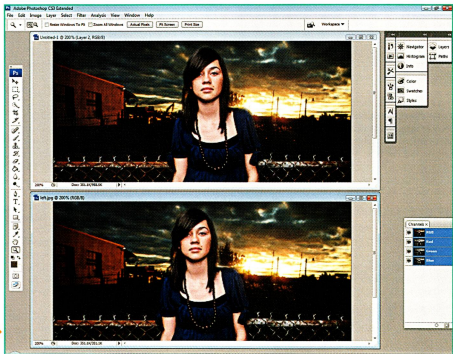
## TAKING PHOTOS

If you want to produce a 3D image, you'll need two images of the same scene taken by cameras

set slightly apart. The problem is that the two cameras have to be exactly the same — the same focal length, the same focus settings, the same aperture and the same zoom. You can't get away with putting a Canon on one eye and a Fuji on the other. If you don't have two identical cameras, you can use the same camera and simply move it a little to the left for the second photo. This will work fine as long as nothing in your image moves between the photos. People, then, are tricky — unless you can get them to sit very still. You'll have much better success taking still life images and scenery.

Colours obviously won't come out as well when seen through a blue and red lens, so it's best to pick shots where composition rather than colour are the main focus of the image. Also avoid fussy edges. It's at the edge of objects that the eye becomes most confused when re-assembling the images, so clear, simple lines tend to be more pleasing.

If you can, find shots with a clear central focus and depth. A flat wall isn't going to work too well, so pick something with definite foreground and background shapes. Finally, you need to make sure the view is the same in both shots. Keep your eyes fixed on a single point and make sure that point is at the same



position in both photos. It's best to pick a distant point and keep it at the centre of both images. That way the final composite image will line up correctly.

#### YOUR OWN IMAGES

Of course, you can avoid problems with photos simply by creating your own 3D views to work with. If you're a dab hand with 3D software, simply create two cameras slightly apart within your favourite 3D package and render away. If 3D modelling isn't your thing, try creating a basic composite using any 2D paint or image manipulation package.

To do this, take a background shot and create two copies of it. Now bring in a foreground object — either a piece of clip art, or an object cut out of a different photo — and paste it into both photos.

On the first picture, move the object to the centre. On the second, move it a little to one side. The more different the placing of the two objects is, the more pronounced the 3D effect will be when you create your finished 3D composite. The more separated the blue and red images, the closer your eye will interpret the object as being, because the closer a real object is to you, the more your eyes will have different views of it.

Once you've created a simple composite with one object jumping out of the screen, you might want to experiment further — placing different parts of the image at different depths to create a more sophisticated 3D picture.

#### COMBINING THE SHOTS

Essentially all that needs to be done is to tint the two shots red and blue respectively and superimpose them over one another (although, it works best if you make them black and white first). You can, if you like, do this in any image-editing package. However, there's a package that will do the job for you. It's called Z-anaglyph, and you'll find it at <http://tinyurl.com/6e4srh>. The instructions are all written in French on installation, but you can change them to English with the 'Preferences' button located at the top-right.

Simply load the left image with the left-hand folder button and the right image with the right-hand folder button and click the 'generate composite images' button (the 3D glasses icon). Your 3D image is instantly created and can be viewed right there and then and saved to disk.

#### 3D VIDEO CLIPS

3D video is a whole new ball game. You can't use the same camera — you'll need two. However, webcams are so cheap nowadays that there's no reason why you can't have two identical ones.

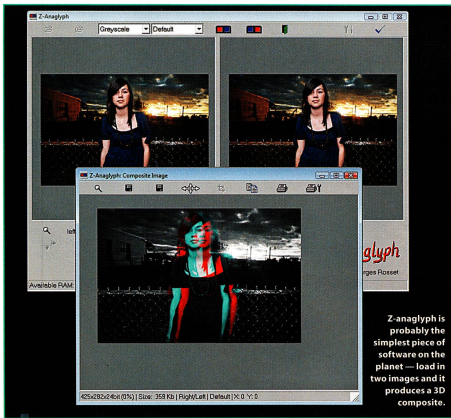
Combining the images from two video cameras is a little more complex than doing it with still images. The principle is the same, but you need to worry about synchronising timings as well as overlaying and tinting the images. That's not to say you can't do it, however, and

#### DO THIS...

There's a similar trick using polarised light and polarised glasses. Put simply, one image is sent with horizontally polarised light, the other with vertically polarised light, and the glasses simply block one type. The upside is

#### TRY USING POLARISED LIGHT

that you can create full-colour images without any problem. The downside is that your computer monitor can't project polarised light, so you would need special equipment to show your creations.



glyph  
ges Rosset

Z-anaglyph is probably the simplest piece of software on the planet — load in two images and it produces a 3D composite.

#### SPOTLIGHT ON... WHY DOES IT WORK?

Anaglyph 3D works because the two images are superimposed over each other and tinted: one red and one blue. When looked at through 3D glasses with one red and one blue lens, the red part is invisible through the red lens and the blue part is

invisible through the blue lens. The viewer then sees the left image with the left eye, the right image with the right eye. The brain fills in the gaps and assumes your eyes are looking at the subject from two different angles — as though it was a solid object.

luckily HeavyMath's Cam3D is a cheap and reliable tool for automating the process.

We've got hold of two Hercules Dualpix Exchange webcams, which allow us to take stills in resolutions up to 2 megapixels (software interpolated) as well as video, so we can use them to record still 3D images or video clips. We've placed ours on top of the monitor a couple of inches apart (you'll need to experiment a little to get the best 3D effect depending on how far from the monitor you're sitting).

Loading up Cam3D, you simply choose the left and right cameras from the drop-down list at the bottom of the monitor. This gives

you an instant 3D display and allows you to choose whether to record audio or not.

Below this is another drop-down allowing you to set the output file name. We chose to record in avi format and chose cinepak compression because it gives a decent end result — it doesn't mess our pictures up too much, and it's also a format we can upload to YouTube so we can broadcast our efforts.

When that's done, you can simply click the 'Record' button to start recording. If you're using the unregistered version, your video will be recorded with a watermark, but you should still be able to produce a perfectly acceptable 3D video. [tinyurl.com/6e4srh](http://tinyurl.com/6e4srh)



# Send SMS text messages from your web site, part 1

APC readers *Brent Knigge*, *Damien McGuire* and *Adam Dukes* show you how to enable your web site to send SMS messages with PHP.

## ABOUT THE AUTHORS

- Brent Knigge is a Senior Analyst Programmer and lecturer at the Australian Catholic University. Damien and Adam are students of his from the COMP306 computing class where they learnt PHP and MySQL programming. Brent is currently based at the Strathfield campus in Sydney, and can be contacted at [brent.knigge@acu.edu.au](mailto:brent.knigge@acu.edu.au).



From left: Brent, Damien, Adam.

## REQUIREMENTS

- **Web hosting**  
Unless you've installed a web server with PHP, you'll want to have some form of web hosting with the ability to run PHP scripts.
- **HTML and PHP knowledge**  
Some understanding of HTML and PHP would be beneficial.
- **An account with an SMS gateway provider**  
An SMS gateway provider makes available for you a series of APIs that allow your scripts to communicate with their SMS server.
- **A mobile phone**  
A mobile phone is required if you want to see the scripts in action. We also assume that you know what an SMS text message is.

**E**nabling your site visitors to send SMS messages from your site can be particularly useful. In this tutorial we'll cover the main steps involved in programming the function into the site using PHP. We'll discuss the need for an SMS gateway provider and the initial steps we took in sending our first text message. From there we'll move onto building a basic web site where we'll be able to enter a message and the recipient's mobile number. Once that is done we'll look towards using PHP to help with the remaining steps, including authenticating ourselves with the gateway provider, processing our web form and sending the text message.

### SMS GATEWAY PROVIDER

Unless you've got your own SMSC (Short Message Service Centre), you'll have to find a company that can provide an SMS gateway for you. Most of the big telcos already have gateways established, but we chose US provider Clickatell ([www.clickatell.com](http://www.clickatell.com)) instead, for three main reasons:

- They have seven APIs (Application Programmer Interfaces) to access their gateway. We're using the HTTP API (which is the most popular), but they also offer SMTP, FTP, COM (plus a few other acronyms we hadn't even heard of) as well.
- It costs between 5.8–7.0 cents to send a standard 160 character text message. The reason for the price range is that it is cheaper to send a text message to the Optus and Telstra network than to the other networks.
- Setting up an account and using the http API is very straightforward.

Another bonus of the Clickatell gateway is that we are not just limited to sending text messages to Australian mobile numbers. The SMS gateway can send text messages to over 201 countries, and in most cases, the cost is the same as sending a message to an Australian network.

Like any registration process you will need to supply a username and password. This will allow you to gain access to the control panel of your account. Once inside you can create sub accounts, register an API, purchase credits,

establish a callback URL for each of your APIs and view any number of reports of your SMS usage.

When you register an API, you also supply a username and password for use with that API. All three pieces of information (API id, username and password) will be used during the authentication process of sending SMS messages. This is very handy because we want to use the API but not have access to the Clickatell control panel. There's a lot more in the Clickatell control panel than what we've covered here, and we'll leave it as an exercise for the reader to explore the other features available.

### THE BARE BASICS

We've registered an http API (which also gives us our API id) to use, which means at the very basic level we could type the required information directly into the URL bar of an internet browser. An example of this is shown below, where you will need to replace the xxxxx placeholder with the relevant information for your API, the username and password, and of course the text message and the number it is being sent to.

```
http://api.clickatell.com/http/sendmsg?api_id=xxxx&user=xxxx&password=xxxx&to=xxxx&text=xxxx
```

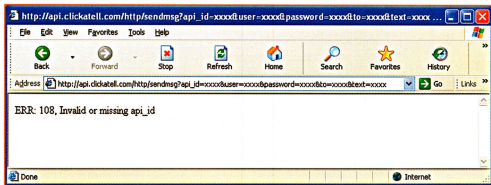
Let's break this URL down and examine each segment of it.

```
http://api.clickatell.com/http
```

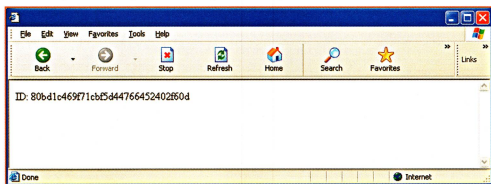
This is the address for the Clickatell http API.

### HANDY TIP

You can't blindly follow our instructions and expect everything will work. We've replaced the actual values for most of the API calls with a placeholder of xxxxx. This is because we don't want you to have our phone number or the username and passwords to access our account with Clickatell. If you want the samples to work, you'll need to create your own account with Clickatell and use your account credentials.



▲ We can type the commands directly into the URL address bar of an internet browser, however, if we don't replace the 'xxxx' placeholders we'll get an 'invalid api\_id' error.



▲ Now we have typed the command directly into the URL address bar with the correct details for the username, password and api\_id. Instead of an error message we get the 'message id' for the message that was sent.



▲ The 'Hello World' message that was typed directly into the URL address bar with the correct credentials is received on the mobile phone.

#### Sendmsg

This is the command that we are using in the http API. Clickatell provides over a dozen API commands ranging in functionality from authentication (which we'll cover later in this Workshop), retrieving account balances, transferring credits between sub accounts, batch messaging and coverage queries.

```
?api_id=xxxx&user=xxxx&password=xxxx&to=xx
xx&text=xxxx:
```

These are the parameters that we are using with the sendmsg command. The api\_id, user and password are used for the authentication, while the 'to' parameter is the mobile number we are sending the message to, and text is the text message we are sending. Later in this Workshop we'll discuss some of the other parameters that can be used with the sendmsg command.

Typing the API command directly into the URL address bar is a quick and convenient technique for testing that the API call works. It is also the first way we sent a 'Hello World' text message via the web and provides us with a basis from which we can start designing a web form for sending text messages.



## UNLESS YOU'VE GOT YOUR OWN SHORT MESSAGE SERVICE CENTRE, YOU'LL HAVE TO FIND A GATEWAY COMPANY

### BUILDING THE WEB PAGE

The first step in building our sms page is to create a web form allowing for the entry of the recipient's phone number and the message to be sent. So we'll create a form with a basic text field for the entry of a mobile number and a small sized text area for the input of a message.

```
<h1>Sending SMS Messages</h1>
<p>Please complete the fields below to send
your SMS message.</p>
<form action=""><?php echo $_SERVER['PHP_
SELF'] ?>" method="post">
<p>Phone Number: <br />
<input type="text" name="Phone_Number"
size="15" maxlength="11" /> </p>
<p>Message: <br />
<textarea name="Message" rows="4" cols=
"50"></textarea> </p>
```

```
<input type="hidden" name="Submitted"
value="TRUE" />
<input type="submit" name="Submit"
value="Send Message" />
</form>
```

The web form code should be self-explanatory for those familiar with HTML, however, we will discuss a couple of the lines in a bit more detail.

```
<form action=""><?php echo $_SERVER['PHP_
SELF'] ?>" method="post">
```

The action attribute tells us what happens when the form is submitted. We've embedded PHP code into the action attribute that simply tells the web browser that when the form is submitted, it is to submit the information to the same page the form was submitted from. Using PHP in this manner means that we can change the filename containing our web form as often





Clickatell: enables you to "Unlock the true power of messaging".

as we want without having to change the value of the action attribute.

```
<input type="hidden" name="Submitted" value="TRUE" />
```

Internet Explorer allows the user to submit forms by clicking the submit button or in some cases, pressing the Enter key. Generally all the elements of a form are submitted when you submit a form, however, if the user presses the Enter key, one form element is usually left out of the submission: the submit button. By using a hidden "Submitted" element, we can capture the form submission regardless of whether the user clicked the submit button or pressed Enter.

At this stage in our discussions it is important to note that SMS text messages have a maximum length of 160 characters for a seven-bit character code. Today's mobile phones however seem to be capable of sending and receiving text messages in excess of this limit. This is accomplished by having multiple text messages concatenated. Thus your 200-character text message would actually be the joining of two individual text messages, and yes, you will be charged for sending two messages, although to your phone and the recipient's phone it would appear as one message.

We decided to preserve the available credits we had and ensure that each text message sent would not incur the multiplier effect as described above. To ensure that we were only charged for one text message we simply truncated the message to a maximum length of 160 characters. It may not be very elegant, it may not be very friendly, but we wanted to concentrate on the basic functionality of the web site without getting you, the reader, lost in an endless debate on design issues.

#### AUTHENTICATING WITH CLICKATELL

Before we move onto processing the web form, we'll first look at authenticating ourselves with the Clickatell server. Authentication is necessary to ensure that a valid user is gaining access to the API, and it also means we can pass a session id instead of our username and password for each http call. The process of authenticating ourselves with the Clickatell server is achieved by using the auth command, and it is used in the same format as the example shown previously when we first sent a text message using the sendmsg command.

#### HANDY TIP

If you're worried about sending your authentication code over an unencrypted http connection, Clickatell also provides an https connection.

## Clickatell

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At Clickatell we provide you with simple, reliable and high-speed messaging services. Our "any message, anywhere" solutions allow businesses and communities to talk to their customers in an immediate and personal way, no matter which communication device they use.

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Clickatell has helped over 8,000 businesses grow their revenues and improve their services with global messaging. We are building on the success of our [SMS gateway](#) to bring you a new generation of mobile messaging. With 1 in 3 people owning a mobile phone, isn't it time you let Clickatell mobilize your business?

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Clickatell is the world's leading provider of [bulk SMS](#) messaging services and SMS gateway connectivity. We offer you access to a secure, dependable, high capacity SMS messaging platform with unrivalled global coverage. Developers get extensive and easy-to-use APIs to help you build your own SMS services on our messaging gateway.

[Learn more](#) | [Free trial](#) | [Test our gateway](#)

#### Coverage and Pricing



Clickatell covers 712 mobile networks in almost 212 countries for outbound messages, and 100 countries for inbound (two-way) messaging. Message delivery includes load balancing and intelligent routing.

[View coverage](#) | [Calculate pricing](#)

#### Meet us @ Events

**African Banking Technology Conference, West Africa**  
Baker May 7 - 8, 2008  
Venues: Eko Hotel, Lagos, Nigeria  
[View website](#)

**IBACPA Payments 2008**  
Baker May 10 - 21, 2008  
Venues: MGM Grand, Las Vegas, Nevada, US  
[View website](#)

#### Banking White Paper



Driving security in the banking and financial services sector  
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#### In the Press

**Clickatell Helps Healthcare Organizations**  
Vignette: Enables the Benefits of SMS | April 15, 2008

**Clickatell Showcases Mobile Authentication at RSA Data Security Conference** | April 08, 2008



## IT IS IMPORTANT TO NOTE THAT SMS TEXT MESSAGES HAVE A MAXIMUM LENGTH OF 160 CHARACTERS

We could use the following instead:

```
$auth_url = "http://api.clickatell.com/http/auth?user=xxxx&password=xxxx&api_id=xxxx";
```

```
http://api.clickatell.com/http/sendmsg?session_id=xxxx&to=xxxx&text=xxxx
```

Calling this URL will either result in an OK message followed by a session id, or an ERR message followed by the error number. The meaning of the error numbers can be found in Clickatell's http API documentation, and there are a total of 27 different error codes.

If we were successful in authenticating ourselves then we will be sent a session ID (random 32 characters) for the API server, which we can then use in place of the user, password and api\_id parameters. Thus, instead of code like this (our very first example):

```
http://api.clickatell.com/http/sendmsg?api_id=xxxx&user=xxxx&password=xxxx&to=xxxx&text=xxxx
```

The session id will expire after 15 minutes of inactivity, and later in this series we'll show you how to authenticate yourself automatically without having to use a net browser and typing the info directly into the URL address bar. [ENTER](#)

#### NEXT MONTH

- Now that we can authenticate ourselves, and we know the API command to send a text message, we need to tie that in with the processing of the web form. If you want to contact the authors of the tutorial, email APC Magazine at [apcmagazinefeedback@apcmagazines.com.au](mailto:apcmagazinefeedback@apcmagazines.com.au) (note apc and apc in the address).

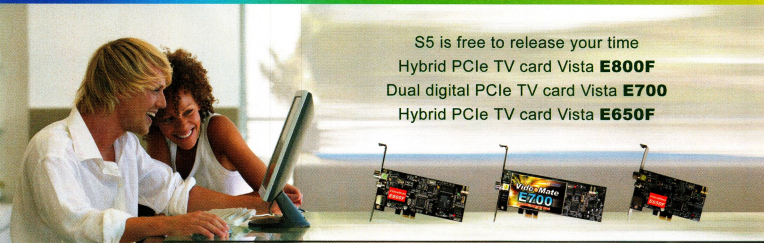
Hybrid USB TV stick Vista **U2800F**

Digital USB TV stick Vista **U100**

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Hybrid TV card Vista **T500F**



VideoMate Vista TV tuner come with Microsoft certified Vista/MCE remote

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**Ultimate** Power On / Off recording automatically

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**High quality** Support SDTV, 1080i HDTV, Subtitles, Teletext and Closed Captions



# downtime

HIGH-PERFORMANCE PLAYTIME

GEAR

GAMES

CHIP CHAT



## Beowulf Director's Cut

In *Beowulf*, the world's oldest poem joins the twenty-first century and becomes the world's most advanced CGI film. Set in the sixth century, a range of semi-clad characters including Ray Winstone (*Beowulf*) and Angelina Jolie (*Grendel's mother*) flirt, fight and die in a stunningly rendered, motion-captured, CGI world. With state-of-the-art surround sound paired with crisp and stunning visuals, Robert Zemeckis has stretched the boundaries of photo-realistic CGI to create a world that at times seems as real as ours. *Beowulf* is a home cinema experience that showcases what true HD viewing can be like.

CONTACT Warner Brothers  
ONLINE [www.au.warnerbros.com](http://www.au.warnerbros.com)  
PRICE \$39.95 (Blu-ray)  
VERDICT ★★★★★



## Hitman Unrated

Timothy Olyphant plays Agent 47, whom we have all come to know from the *Hitman* games. The plot here is simple, 47 has been set up and is forced to traipse across Europe to clear his name, bloody dispatching all manner of bad guys along the way (whilst doing bad Clint Eastwood impressions, we might add). For an action film it's not too bad. The gore and overly stylish camera shots detract from the action, causing the viewer to be aware they are watching a film. You get the idea that the director Xavier Gens has tried a little too hard with this one. For all the wrong reasons, fans of the game will most likely enjoy it.

CONTACT Twentieth Century Fox  
ONLINE [www.foxmovies.com.au](http://www.foxmovies.com.au)  
PRICE \$39.83 (Blu-ray)  
VERDICT ★★★★★



## Procurve Pivoting Head men's shaver

Some of you might say: "What the hell is a shaver doing in *APC?*". With an LCD display, a rechargeable battery and a linear motor that moves at over 13,000 revs per minute, we'd say that this can definitely be classed as a gadget. With an adjustable pivoting head, this triple blade shaver gives great results in a hurry for when you're running late in the morning. Hell, you can even take it in the shower with you to save time! A pop-up beard trimmer can help give you that overly groomed Craig David look, or you could just get creative with your sideburns. Just because we're geeks doesn't mean we can't look good.

CONTACT Panasonic  
ONLINE [www.panasonic.com.au](http://www.panasonic.com.au)  
PRICE \$219  
VERDICT ★★★★★



## STM 15in & 17in Rogue laptop bags

If you're like us, you might feel a little self-conscious walking the streets with what is obviously a laptop bag slung over your shoulder. STM solves the problem with its new Rogue range of backpacks that look like anything but a laptop bag. With a strong, sturdy design that has more in common with hiking gear, the Rogue will fit any PC with a screen size of up to 17 inches. With oodles of space, a phone pouch, an iPod pouch and more knobs and crannies to hide things in than you will ever need, we recommend this to anyone who is looking to protect their mobile technology discreetly.

CONTACT STM  
ONLINE [www.stmbags.com.au](http://www.stmbags.com.au)  
PRICE \$169.95 (17in)  
VERDICT ★★★★★





## Micro remote control helicopter

This little thing is about the most fun you can have for less than \$25. Built to fly indoors, the Micro RC Helicopter is hours of fun, if albeit in short 10-minute bursts. The only drawback to this product is the constant need to keep recharging the small palm-sized chopper. Looking small and fragile, this chopper is actually well built and is stronger than it looks. Being lightweight, you can safely crash it into any fixture in your home without doing any damage to it or your possessions. The controls take a little getting used to, but with a little practice, you'll be dive-bombing the cat and scaring the hell out of the kids in no time.

CONTACT Super Talent  
ONLINE [www.toyrange.com](http://www.toyrange.com)  
PRICE \$24.90

VERDICT ★★★★★

## Lowepro Spectrum camera pouches

Scratched LCDs on digital cameras are a pain in the butt, but we've found just the thing to avoid that. Featuring a single main compartment with a padded lining of brushed-tribit material to protect camera displays from abrasion, the Spectrum range of camera pouches promise to keep dirt and moisture away from your digital compact. With reverse-zipped compartments, interior mesh pockets for safe storage and easy access, plus a water-resistant outer fabric that comes in five colours and three sizes, you could look at these pouches as being a stylish form of damage control.

CONTACT Lowepro  
ONLINE [www.maxwell.com.au](http://www.maxwell.com.au)  
PRICE \$19-\$23

VERDICT ★★★★★

## Lightcast interactive music light

Just in case you didn't have enough things to plug your iPod into, here's another one. Just plug any audio device into Lightcast, crank up the music and it will turn your room into a mobile disco. Multi-coloured lights will dance and bounce across your walls and ceiling in time with the beats to whatever music you choose to play. With four speed settings, you can set it for a slow relaxing dance of light or fill the room with a myriad of hyperactive lights. Whatever your taste, you can get as mellow or as manic as you like. Just don't stare into it for too long, as the blinking lights can be a little hypnotic.

CONTACT Farm Fresh  
ONLINE [www.latestbuy.com.au](http://www.latestbuy.com.au)  
PRICE \$99.95

VERDICT ★★★★★

## Super Talent PICO USB drives

Touted as the world's smallest 8GB drives, the new range of PICO USB keys push the boundaries of portable storage. Shock-resistant and with swivel lids for protection, Super Talent's USB drives are backed with a lifetime warranty and are manufactured using chip-on-board (COB) technology, which enables up to 8GB of Flash storage to fit into an incredibly minute case, the smallest of which, the PICO-C (pictured), measures only 31.3mm x 12.4mm x 3.4mm. With read speeds of up to 30MB/sec (200x) accessing data is as fast as you need. Now all you have to do is find the damn thing under all the other junk in your bag.

CONTACT Super Talent  
ONLINE [www.supertalent.com](http://www.supertalent.com)  
PRICE US\$35

VERDICT ★★★★★





# Advance Wars: Dark Conflict

Peter Dockrill graduates from tiny-tot military academy.

One criticism often levelled at Nintendo by 'mature' gamers is the cutesy tag: that the company's games are too kiddy in nature, with cute, cartoony characters and critters that make anyone over the age of ten want to reach for the sick bucket. And perhaps nowhere is this more evident than the Advance Wars series. Even tackling a topic as gravely serious as modern warfare, Nintendo still managed to populate the titles with cutesy combatants, brightly-coloured battalions and chirpy chutzpah. Luckily, the series

also invariably featured addictive and intense turn-based portable strategy, which helped overcome any aesthetic shortcomings. This fourth entry is the first to feature a stylistic upgrade to a grittier, post-apocalyptic landscape, dispensing with the primary-green fields of the previous trilogy. The story is also darker, but Dark Conflict still features the same hard-to-put-down gameplay that will have you wondering where those past few hours went. The campaign mode is a real pleasure, although a bit over-talky, but the real boon for AW

#### AVAILABLE PLATFORMS

PC	Wii	PS 3
PC	Wii	PS 3
DS	DS	DS

CONTACT Nintendo  
ONLINE [www.nintendo.com.au](http://www.nintendo.com.au)  
PRICE \$69.95

✓ Gritty new style; another excellent entry in the series.

✗ Renovation more than reinvention.

VERDICT ★★★★★

veterans will be the addition of online multiplayer. Take no prisoners.



Dual-screen animations keep you up to date on all the latest sparring.

# God of War: Chains of Olympus

Troy Coleman is a Greek God: do his bidding, fear his wrath.

God of War: Chains of Olympus (CoO) is, hands down, the best game ever to be released on the PSP. Set 10 years prior to the original God of War game, CoO finds the protagonist Kratos defending the city of Attica from the invading Persians and a Basilisk at the behest of the Gods. Armed with your trusty Blades of Chaos and a vengeful demeanour, you progress through this third-person platformer by slaughtering everything in sight and solving puzzles, while navigating through a visually stunning landscape.

Level design is fantastic; environments feel incredibly vast and moody — even on the small screen of the PSP. Controlling the game remains more or less the same as previous versions, and the learning curve for God of War virgins is shallow. The soundtrack adds an incredible sense of immersion so headphones are a must. Our one and only grievance with CoO is the length. It took us around seven hours to clear through to the final boss, which, for our money is a little on the short side.

#### AVAILABLE PLATFORMS

PC	Wii	PS 3
PC	Wii	PS 3
DS	DS	DS

CONTACT Sony  
ONLINE [www.godofwargame.com](http://www.godofwargame.com)  
PRICE \$59.95

✓ Fun; highly addictive.

✗ Wish it was longer.

VERDICT ★★★★★

Another hour or so of gameplay and CoO would have taken away full marks.



# Everybody's Golf: World Tour

Chris Zammit gets anime-ted on the golf course.

With Japanese-style animation and overly cute dialogue, Everybody's Golf: World Tour (EGWT) looks like a too cute anime-styled golfing game for kids. But that isn't the case. Underneath is a challenging and true-to-life golfing experience. With wind speed, varying terrains and even the odd wandering spectator to contend with, EGWT provides enough obstacles to make the game a real challenge. The X button is about the only one you'll need, as the art of mastering the perfect swing is all

about timing. Simply aim your player at the hole, press x when the club goes up to the height you need for the desired force of the swing, then wait, and press x again when the circle over the ball shrinks to its minimum size to register the accuracy of the shot. That's pretty much it. With 3D terrains represented on a 2D screen, judging distances is the main challenge here, as is figuring out the slopes of the greens. You have an anime caddy who gives advice, although sadly she speaks slower

#### AVAILABLE PLATFORMS

PC	Wii	PS 3
PC	Wii	PS 3
DS	DS	DS

CONTACT Sony  
ONLINE [au.playstation.com](http://au.playstation.com)  
PRICE \$99.95

✓ Great gameplay.

✗ Sickeningly sweet.

VERDICT ★★★★★

than she runs, so you generally end up shooting before she can give you her advice.



That's it. Swing and hit the ball. Now do that a couple more hundred times.



# Bully: Scholarship Edition

It's Peter Dinklage's first day at Bullworth Academy.

Over a year after the furore created by its controversial original format release, *Bully: Scholarship Edition* — or *Canis Canem Edit* ('dog eat dog'), as the PAL PS2 2006 version was eventually dubbed — has finally been unveiled in a remixed edition for the Wii and Xbox 360.

This highly original and provocative game sees you take on the role of young Jimmy Hopkins, an errant 15-year-old schoolboy who's off to a rough start on his first day at (his

latest) school — the fearsome Bullworth Academy.

In addition to attending (or perhaps not) his daily classes, Jimmy has a continual number of tasks to perform in and around the school grounds — these start off with a pretty basic feel but end up developing into the plot elements of a pretty large and meaty 'boy's own' tale.

The sandbox nature of the game means there's always lots to see and do, but the need to attend class does curb the feeling

of schoolboy freedom somewhat. However, lessons themselves are part of the fun, and all in all you'll find that the variety of things to do at Bullworth — sanctioned or not — makes for a great and dramatically complex psycho-comedic fable.

New Wii-specific content adds a little more interactivity to an already polished adventure, and the price offers good value — but take note: ironically enough, this probably isn't one for younger players.



#### AVAILABLE PLATFORMS

PC-DVD	Wii	PS 3

CONTACT Rockstar Games

ONLINE [www.rockstargames.com](http://www.rockstargames.com)

PRICE \$79.95

Freewheeling anarchic fun.

A bit of a regimented mini-GTA.

VERDICT ★★★★★

# Audiosurf

Alex Cox drives over some of his favourite bands, without a licence.

Some games are just games. Others are far more than that; they're so significant they redefine the landscape of gaming. Audiosurf, for all its initial promise and charming construction, falls smack between the two categories.

On the one hand it applies the fantastic concept of algorithmic level generation to your music collection, turning your tunes into an undulating rollercoaster of a race track.

On the other hand, the actual game that's generated (a mish-mash of Klax, Guitar Hero and the

most basic three-lane racing game 1978 ever produced) quickly feels limited. You're always acutely aware that you're not really playing a traditional rhythm game — you're playing an extremely basic driving game with a puzzle element tacked on.

There are reams of modes to choose from, each of which changes the core rules just a little: sometimes you're dodging blocks, sometimes you can catch them. The online scoreboards, if anything, add the most addictive element to the game. Competing with others for

#### AVAILABLE PLATFORMS

PC-DVD	Wii	PS 3

CONTACT Steam

ONLINE [www.steamgames.com](http://www.steamgames.com)

PRICE \$10

Price; online scoreboards.

Feels limited.

VERDICT ★★★★★

supremacy on whatever pop classic takes your fancy is a strong emotional driver.



There's nothing quite like scoring full points on 'Crocodile Rock'...



# Gran Turismo 5: Prologue

Chris Zammitt goes on a racing tour of Europe.

GT5: Prologue is a slick affair with well-designed menus and an all-round classy feel. Although there are only six tracks available, players have the option of racing in either direction, which adds a little more variety to what would otherwise be limited play. Alternatively, you can hook yourself up to the net and join thousands of other GT fans the world over who are already battling it out in 16-player online events.

Many of the major car manufacturers have jumped on

board, with detailed models of 71 real-world vehicles which are available for sale in the Dealership menu. Everyone from Audi to Akura have customisable cars, which you can purchase with your winnings from the class A, B or C racing events. Once on the track, the game looks amazing. With stunning scenery and amazingly detailed cars to pass, GT5: Prologue sets a

new benchmark for racing games. The controls are true to life with well-timed gear changes and accurate braking necessary to make finishing anywhere near the front of the pack possible. For those of us who will never be given the opportunity to drive a Ferrari 599 or a Lotus Elise, GT5: Prologue is the next best thing.

#### AVAILABLE PLATFORMS

PC-DVD	Wii	PS 3

CONTACT Sony

ONLINE [au.playstation.com](http://au.playstation.com)

PRICE \$59.95

Getting to drive the best cars in the world.

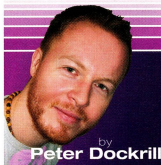
Not enough tracks... yet.

VERDICT ★★★★★





## chip chat



by Peter Dockrill

WIPING  
THE HARD DRIVE

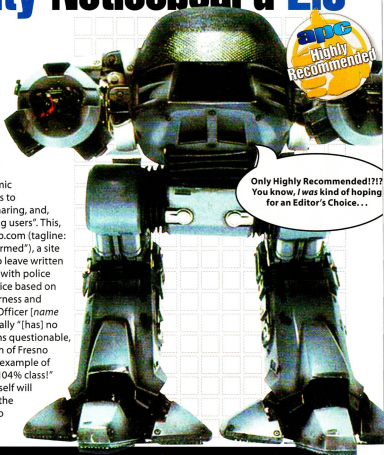
No drivers available. Compatibility issues. Not enough RAM. Non-optimised. Wait until the Service Pack. Stick with XP for now... Yep, there's a string of complaints people seem to have about Microsoft's latest operating system. And now, we're proud to present the perfect solution for your Vista blues! And nope - it's not a system update or a hotfix. What we have here is the official Microsoft Windows Vista Ultimate Toilet Paper. Yep, next time your PC freezes up (or UAC interrupts, or - hell - just because you wanna stick it to the man), why not take your frustrations out on this quality two-ply TP? Only thing is, it's only available in Japan...



Kind of gives 'service pack' a whole new meaning, doesn't it?

## Community Noticeboard 2.0

Web 2.0's all about community. While the first iteration of the mainstream internet seemed to largely reflect a consumerism model, whereby users for the most part browsed and downloaded information and content from established commercial providers, the new forefront of the web presents a more egalitarian dynamic that, according to Wikipedia, "aims to facilitate creativity, information sharing, and, most notably, collaboration among users". This, inevitably, brings us to RateMyCop.com (tagline: "You have the right to remain informed"), a site which enables "registered users to leave written feedback about their interactions with police officers and rank the officer's service based on three criteria: Professionalism, Fairness and Satisfaction." Of course, whether Officer (name withheld) of Salinas Police Dept really "[has] no business wearing a badge" remains questionable, but it's nice to know Officer Barron of Fresno Police Dept is purportedly "A fine example of what officers should strive to be. 104% class!" One day, maybe even ED-209 himself will receive a rating. Until then, for all the latest cop reviews, head on over to <http://ratemycop.com>.



APC  
Highly  
Recommended

Only Highly Recommended!??  
You know, I was kind of hoping  
for an Editor's Choice...

## set to stun?

In APC April (page 103), we showed you how to build a *Star Trek*-style Phaser gun. Now, since then, lasers have gotten a bit of a bad rap (<http://snipurl.com/23bv3>), and we here at the mag firmly stress: use your laser responsibly! Like we said in our original piece, be careful not to blind anyone. Nope, you can leave that to the authorities - what you see here is the Personnel Halting and Stimulation Response (PHASR) rifle, which presumably remains in development with the US Department of Defence's Air Force Research Laboratory's Directed Energy Directorate (sheesh!). Prototypes of the device were unveiled in 2005, and since then, progress reports on development have been scant. The PHASR, whose sole

aim is to subdue targets by temporarily dazzling them, is argued to evade the prohibitions of the UN's 1995 Protocol on Blinding Laser Weapons, as the blindness it induces is said to be non-permanent. A real case of 'see you later'. **REACT**



## Australian Internet Data Centre: Think Globally, Host Locally ...premium quality at affordable prices

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Australian located dedicated web servers.  
Personal and small business hosting at  
affordable prices.

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Reseller plans available.

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Entry level to Enterprise Dedicated Servers  
available. Hosted on our redundant  
Cisco Core Network for optimal reliability.

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### ■ CO-LOCATION

From 1 Server to multiple cabinets. Our own  
state-of-the-art, Carrier Neutral facility  
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Register your Domain Names now  
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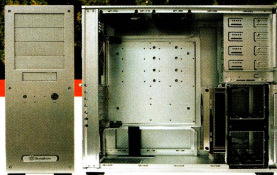
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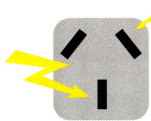
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• 20 sheets  
A6 (105x148mm)... **\$ 6.90** TPP284B  
A4 (210x297mm)... **\$16.90** TPP281



\*Of equal value or less

**Samsung Ink Cartridges**

**Model TONNY**  
M40 **\$23.00**

**NEW! Canon Models**

Model	Genuine	TONNY
PGI-5BK	\$22.50	\$8.50
CLJ-8BK	\$22.50	\$8.50
CLJ-8CMY	\$22.50	\$8.50
CLJ-8PC	\$22.50	\$8.50
CLJ-8PM	\$22.50	\$8.50



Rated 9 out of 10 by PC User

**Canon Ink Cartridges**

Model	TONNY	Model	TONNY
BCI-24BK	\$5.60	BCI-24C	\$7.20
BCI-24B	\$5.60		
BCI-24C	\$7.20		
BCI-24M	\$5.60		
BCI-24Y	\$5.60		
BCI-24BK	\$5.60		
BCI-24C	\$7.20		
BCI-24M	\$5.60		
BCI-24Y	\$5.60		
BCI-24BK	\$5.60		
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BCI-24Y	\$5.60		

# TELEPHONE LINE SOLUTIONS

Save Money, Improve Efficiency or Add a Professional Touch to Your Line

SINCE 1990

## TELEPHONE CALL RECORDING FOR ANY APPLICATION

### LINE CONNECT model

CRUZ2 is designed to connect direct to ANY telephone extension, to provide High Quality telephone call recording to your PC (PC software provided) or other recording device. Provides automatic operation with start/stop capability from any telephone.



### HANDEXT CONNECT model

CRUZ3 is designed to connect to any PABX, COMMANDER, PSTN or VOIP handset. Will then provide High Quality telephone call recording to your PC (PC software provided). Automatic operation with start/stop activation from your PC.



### PROFESSIONAL model

CRUZ4 provides all facilities of the CRUZ2 Model (it connects to any Handext) and in addition allows messages) or previous recordings to be played back to the other party at any time. Allows notes to be tagged to the recording file.



### AUTO DIGITAL ANNOUNCEMENT

Our AUTOMATIC ANNOUNCEMENT Device will Answer your incoming telephone calls, play an announcement and then resume ringing of your telephones. Ideal for announcing change of number or that the call will be recorded.



## TELEPHONE LINE DOOR STATION SOLUTIONS

### DOOR STATION UNIT

DS2 will RING all of your telephones when a visitor arrives at your front door or gate. Answer to communicate. Open the door or gate with touch tones. Operates on any ordinary single line or multi-line phone system. Requires surface mount or flush mount door phone.



### PABX DOOR STATION UNIT

DS4 is designed to be connected to an analogue extension of any PABX, Commander or other multi-line telephone system. DS4 goes "on hook" when activated by the door phone. Requires surface mount or flush mount door phone.



### DOOR STATION DIAL OUT

Our New DS6 model will RING your telephones and then DIAL OUT to a pre-programmed telephone number if a visitor arrives and you are not home. Requires Surface Mount or Flush Mount Door Phone. Can also connect to a PABX extension.



### DOOR PHONES



A range of door phones are available

## SHARE YOUR LINES AND SAVE INSTALLATION & RENTAL CHARGES

### FAXSTREAM DUET SWITCHES

Will allow any Fax or Modem device to operate with the Tetra FaxStream Duet service. Provides fully automatic fax reception, just like having a separate line. Two models are available.



### INTELLIGENT FAXSWITCH

FAX SWITCH will allow your existing Fax Device to connect to any Single Telephone Line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Fax operation. Will operate with all existing telephones and also an Answering machine.



### INTELLIGENT MODEMSWITCH

MODEM SWITCH allows your existing Data Modem Device to connect to any Single Telephone Line, Fax Line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Dial In & Dial Out Modem Data operation. Models available that allow up to 8 devices on 1 line.



### EFTPOS SWITCH

EFTPOS SWITCH will allow your existing EFTPOS device to share any existing Single Telephone Line, Fax Line or a Multi Line (PABX) phone system. Provides automatic connection on dialing. BARGE-IN protection prevents interference when line is in use. Alternative model will allow operation on 2 lines.



## MISCELLANEOUS TELEPHONE LINE APPLICATIONS

### VOIP SELECTOR

This device will allow you to connect one or more telephones to your TELEPHONE LINE and VOIP LINE. Incoming calls from either line ring on the connected telephones. Outgoing calls are automatically DEFAULTED to ONE LINE, but the alternative line can be selected by DTMF code.



### TWO LINE SELECTOR

Premium device will allow you to connect one Telephone Device to two Telephone lines (Tetra, Optus, VOIP, PABX etc). Ideal for EFTPOS, Cordless Phone, Modems etc. Additional features are provided, including automatic fax manual selection of an alternative line if the default line is busy.



### TELEPHONE CALL TRANSFER

Easy Transfer will allow you to answer a call on one telephone and then TRANSFER the call to another telephone fitted to the same line. Also provides INTERCOM facility. Uses your existing telephones.



### MULTIPLE NUMBER SWITCH

Operates Two numbers on one line. This device will connect your Multiple number calls to one set of phones or answering machine and your Normal number calls to another set of phones or answering machine.



## TELEPHONE LINE ON HOLD SOLUTIONS

### MESSAGE ON HOLD

DMR, Australia's Leading On Hold player, is an MP3 based Message On Hold Device, designed to provide the High Quality and High Reliability that is necessary for all telephone on hold applications. Easy message change provided by replacing memory card.



### AUTOMATIC CALL ATTENDANT

Our single line CALL ATTENDANT will answer your incoming calls after 4, 6 or 8 rings, play a greeting & then put your call on hold until you are able to answer. Also provides Message on Hold facility for your single line.



### BACKGROUND MUSIC SYSTEM

High Quality BMS holds up to 4GB of MP3 Music! Messages on a SD Flash Card. Plays Messages at user set intervals. Powerful internal amp will allow direct connection of up to 8 speakers. Line Level output is also provided. Has encryption facility.



### MESSAGE ON DEMAND

TDS can be programmed with up to 256 MP3 based messages stored on an MMC/SD card, which can be recalled and played by keypad entry or time programmed sequences.



## MORE MISCELLANEOUS EQUIPMENT

### TELEPHONE LINE SIMULATOR

This TELEPHONE LINE SIMULATOR can be used for testing, programming & deconstruction of analogue telecommunications equipment, without the need to use a telephone line and generating costly calls. 4 Models are available.



### RING INDICATOR

This device detects incoming calls and will co-operate a relay to match the cadence of the incoming ring. Can also be set to close a relay until a call is answered. Ideal for control of external horns or lights to advise of an incoming telephone call.



### REMOTE TELEPHONE ACTIVATOR

Call in to Switch ON, Switch OFF or RESET your PC, SERVER or any electrical equipment by telephone line using touch tone commands. RITA connects to any telephone line. Requires PCU accessory. 3 models are available.



### POWER CONTROL UNIT

PCU connects direct to the RITA and also to your power socket to allow telephone line dial in switching of the 240V supply connected to your equipment. Easy Plug in User Installation. Controls up to 10 Amps.



**National Communications**  
Australia's Telephone Line Sharing Company

For a full description of your solution, please call our Factory DIRECT

Australia : Phone (07) 5596 5128 (8AM-5PM AUS Time)  
New Zealand : Phone 0800 6282666 (10AM-7PM NZ Time)

**2 YEAR FACTORY WARRANTY**  
**30 DAY UNCONDITIONAL**  
**MONEY BACK GUARANTEE**



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Web Site: [www.natcomm.com.au](http://www.natcomm.com.au) Email: [info@natcomm.com.au](mailto:info@natcomm.com.au)

## PARTNER - IT/COMMS PROFESSIONAL

A successful IT professional, with sales and marketing experience, is sought to assist this well respected business with its continued growth. This is a unique opportunity to purchase an interest in a successful dynamic business, established for 17 years and located on the Gold Coast. A full partnership is available for the right person. Interested parties should contact: [ron@natcomm.com.au](mailto:ron@natcomm.com.au)





# PCICASE GROUP

## Australia

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Fax: +61 (2) 9648-1137  
sales@pcicase.com.au  
www.pcicase.com.au

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Glenfield, Auckland  
New Zealand  
Tel: +64 (9) 441-3205  
Fax: +64 (9) 441-3207  
sales@procase.co.nz  
www.procase.co.nz

# Compact - Efficient - Fanless - Flexible

## World's Smallest Mobo

- All in One
- VIA Luke CoreFusion™ Processor onboard with Integrated UniChrome™ Pro AGP graphics w/MPG-2 Acceleration
- DDR 266/333/400 (SODIMM)
- 1 Mini-PCI slot
- VIA Vinyl 6 Channel Audio
- 6 USB 2.0 ports
- VIA 10/100 LAN
- VIA TV Out (HDTV)
- LVDS/DVI (optional)
- Nano-ITX (120mm x 170mm)
- Digital Media and Mobile Entertainment



Model: EPIA-N



- All in One
- VIA C7™/Eden™ Processor onboard with Integrated UniChrome™ Pro AGP graphics w/MPG-2 acceleration
- DDR400/533
- 1 PCI slot
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 6 USB 2.0 ports
- 2 COM ports
- GLAN Controller
- TV Out (HDTV)
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Digital Media, Entertainment, Set Top Box



Model: EPIA - EN



## Powerful and Flexible Digital Media

- All in One
- VIA C7™ Processor onboard with Integrated UniChrome™ Pro AGP graphics w/MPG-2 acceleration
- DDR400/533
- 1 PCI slot
- Vinyl 6 channel Audio
- 8 USB 2.0 ports
- 1 COM port
- 10/100M LAN
- TV Out
- Mini-ITX (170mm x 170mm)
- KIOSK, Thin Client



Model: EPIA - CN



- All in One
- VIA C3™/Eden™ Processor onboard with Integrated UniChrome AGP graphics w/MPG-2 Acceleration
- DDR 266
- CardBus/CompactFlash Support
- 1 PCI slot, 1 Floppy Connector
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 4 USB 2.0 ports
- 2 COM ports
- VIA 10/100 LAN
- TV Out
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Wireless Media, Kiosk, Set Top Box



Model: EPIA - MII



## Hard Working Small & Quiet Systems

- All in One
- VIA Luke CoreFusion Processor with Integrated UniChrome Pro AGP Graphics with MPEG-2/MPG-2 Acceleration
- DDR 400 DIMM
- 1 PCI slot
- 2 SATA ports
- VIA Vinyl 6 Channel Audio
- 8 USB2.0
- 4 COM ports
- 2 VIA 10/100 Ethernet (1 optional Gigabit)
- 1 Digital I/O 48P/40P
- LVDS/DVI (optional)
- Mini-ITX Form Factor (170mm x 170mm)
- Always-on Point of Sales Applications



Model: EPIA - EK



## Digital Media and Entertainment

- All in One
- VIA C3™/Eden™ with Processor onboard Integrated UniChrome AGP graphics w/MPG-2 Acceleration
- DDR 266
- 1 PCI slot, 1 Floppy Connector
- Vinyl 6 channel Audio
- IEEE 1394 Firewire
- 4 USB 2.0 ports
- VIA 10/100 LAN
- TV Out
- LVDS/DVI (optional)
- Mini-ITX (170mm x 170mm)
- Digital Media and Entertainment



Model: EPIA - M



## 19" Mini-ITX Rackmount

### Model No.: T677

- 19" 1U Rackmount
- Internal 3.5HD x 1
- PCI Expansion Slot x 2
- Slim Type CD / DVD x 1
- 45(W) x 44(H) x 40(D)
- Cooling: 2 x 40mm fans
- Power and HDD Indicators
- Mini-ITX (170mm x 170mm)
- Power on/off



19 inch

## Firewall/VPN/Telephony/Telecom/VoIP Network/Security/Military Application

### Model No.: C1B

- 19" 1U Rackmount
- Internal 3.5" HDD x 1
- Internal 2.5" HDD x 1
- PCI Expansion Slot x 1
- Slim CD-rom/DVD-rom x 1
- 19"(W) x 13"(D) x 1.75"(H)
- Mini-ITX (170mm x 170mm)
- Cooling: 2 x 40x26mm fans
- Power on/off and system reset
- Power, LAN and HDD Indicators



## Firewall/VPN/Telephony/Telecom/VoIP Network/Security/Military Application

### Model No.: C1E

- 19" 1U Rackmount
- Internal 3.5" HDD x 2
- PCI Expansion Slot x 1
- Slim CD-rom/DVD-rom x 1
- 19"(W) x 14.5"(D) x 1.75"(H)
- Front access USB & LAN ports
- Power LAN and HDD indicators
- Up to 12" x 9.6" ATX size mobo
- Power on/off and system reset
- Cooling: 1 x 97mm blower or 2 x 40x56mm fans



## World's Smallest Case

### Model No.: 1677

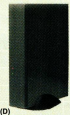
- Color: Black
- Front Port: USB x 2
- Internal 2.5" HDD x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Nano-ITX (120mm x 120mm)
- Power on/off and system reset
- 82.5mm(H) x 160mm(W) x 163mm(D)



## Home Media Center, Set Top Box, Kiosk, Wireless Media

### Model No.: 2677

- Color: Black
- Expansion Slot x 1
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 63.5mm(H) x 295mm(W) x 272mm(D)



## Home Media Center, Set Top Box, Kiosk, Wireless Media

### Model No.: 2600

- Color: Black
- Expansion Slot x 1
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- Slim Type CD / DVD x 1
- 63.5(H) x 295(W) x 272(D)
- Mini ITX (170mm x 170mm)
- 60W/80W Power Adaptor
- Power on/off and System Reset
- USB 2.0, Audio x 1, Mic x 1, 1394 x 1, IR Module (Optional)



## Set Top Box, Thin Client, Car Entertainment, Smart Mini PC

### Model No.: 3677

- Front Port: USB x 2
- Internal 2.5" HDD x 1
- 6cm Cooling Fan x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 65mm(H) x 210mm(W) x 275mm(D)



## Set Top Box, Thin Client, Car Entertainment, Smart Mini PC

### Model No.: 3688

- Front Port: USB x 2
- Internal 2.5" HDD x 1
- 6cm Cooling Fan x 1
- Slim Type CD / DVD x 1
- 60W/80W Power Adaptor
- Mini ITX (170mm x 170mm)
- Power on/off and system reset
- 65mm(H) x 210mm(W) x 258mm(D)



## Stylish Cube Entertainment centers

### Model No.: 669

- Expansion Slot x 2
- Internal 3.5" HDD x 1
- 4cm Cooling Fan x 2
- External 3.5" HDD x 1
- External 5.25" HDD x 2
- 200W ATX Power Supply
- Mini-ITX (170mm x 170mm)
- USB2.0 x 2, 1394/Audio/Mic x 1
- 206mm(H) x 225mm(W) x 330mm(D)





## CD & DVD DUPLICATION

BUSINESS CARD AND MINI CDs  
IN HOUSE MULTIMEDIA, DESIGN,  
PRINTING & PACKAGING  
DVD AUTHORIZING  
ANY QUANTITY



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Roy Morgan Survey June 07

### Web Hosting

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- includes **FREE .com Domain!**
- **1 Gb** Disk Space
- **10 Gb** Monthly Data
- Reseller hosting from **\$44** p/m

### Virtual Private Servers

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- **20 Gb** Disk Space
- **200 Gb** Monthly Data
- High performance VPS Layer
- "One Click" image backups and restores

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- **400 Gb** Monthly Data
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- Co-Lo from **\$140** per month

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## Technology Buyers Guide

Edition 3 2008

# Australia's Lowest Prices

Guaranteed to beat Harvey Norman, Dick Smith, Officeworks & Harris Technology\*

### 250GB in your pocket - USB Hard Drive

#### WD Passport Essentials 250GB

With a beautiful gloss case that fits smoothly in your hand and pocket, the elegant little My Passport Essential Portable USB Hard Drive from Western Digital has mega-capacity for all your digital content. The world's most sought-after portable drive just became the most stylish way to carry thousands of songs or pictures.

##### Price Checker

Dick Smith	N/A	Harris Technology	\$199
Harvey Norman	\$199	Officeworks	\$249

**\$189**

SAVE \$10 off RRP  
WebCode: WDD0147



PC USER  
BEST BUY

### Network-ready @ a bargain price

#### Fuji Xerox DocuPrint C1110A A4 Colour Laser Printer

- Print Speed: 16ppm mono / 12ppm colour
- Resolution: 9600 x 600 dpi
- Connectivity: 10/100 Ethernet, USB 2.0
- Duty Cycle: up to 40,000 pages per month

##### Price Checker

Harvey Norman	\$399	Harris Technology	\$399
Not available at Dick Smith and Officeworks			

You Pay \$484

**\$284**

After \$200 Cashback\*

SAVE \$315 off RRP  
WebCode: FXP1111



BONUS  
\$200  
Cashback

**WIN**

**1 of 3 ASUS Notebooks**  
Buy any Microsoft product to go into the draw

**WIN**  
ASUS

Look for this symbol  
for eligible products  
see back page for details

### Windows XP version

#### ASUS Eee PC Notebook Black

Intel Dohan 900MHz Processor  
512MB DDR2 Memory  
4GB Solid State Disk  
7" XGA Display  
Intel GMA 900

##### Price Checker

Not even available at  
Dick Smith, Harvey Norman,  
Harris Technology and Officeworks

**\$562**

SAVE \$37 off RRP  
WebCode: ASU0781



### Perfect for MSN Messenger & Skype

#### Mini USB Notebook Webcam

- 2 megapixel lens
- Built in Microphone
- Take quick photos with the snap shot button
- Perfect for Messenger Live or Skype

50%  
Saving

##### Price Checker

**EXCLUSIVE TO  
CITY SOFTWARE**

**\$34**

SAVE \$35 off RRP  
WebCode: SIG0017



### Upgrade to wireless freedom

#### Microsoft Wireless Desktop 1000

Microsoft Wireless Desktop 1000 offers a complete desktop solution. You get the features that make life easier, like wireless freedom, precision optical performance, and one-touch Hot Keys.

##### Price Checker

Dick Smith	\$79	Harris Technology	\$79
Harvey Norman	\$79	Officeworks	\$79

**\$59**

SAVE \$21 off RRP  
WebCode: MST8356



### A must-have for an efficient business

#### Quickbooks Plus 2008/09 QBI series

Integrated payroll management  
Track and manage inventory  
Produce business reports  
Easy to set up and use

NEW



##### Price Checker

Dick Smith	\$579	Harris Technology	\$559
Harvey Norman	\$579	Officeworks	\$579

**\$541**

SAVE \$38 off RRP  
WebCode: QUI0152

### Best value point of sale software

#### Quickbooks Retail Point of Sale Lite 2008/09

- Point of Sale made easy
- Seamless integration to QuickBooks QBI series
- Touch screen enabled

NEW  
Released late April



##### Price Checker

**FIRST TO MARKET!**

**\$254**

SAVE \$35 off RRP  
WebCode: QUI0161

### Fast PC & internet security in a box

#### Norton 360 2.0 + 2GB USB

Norton 360 2.0 provides industry leading protection for everything computer users care about.

NEW



##### Price Checker

Dick Smith	\$127	Harris Technology	\$119
Harvey Norman	\$129	Officeworks	\$129

**\$106**

SAVE \$23 off RRP  
WebCode: SYM9929

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- Claim your rebates online!

### And best of all, it's free to join!

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## Windows Vista

Announcing Windows Vista with Service Pack 1

## Why buy Windows Vista with Service Pack 1?

Because it's safer, more reliable, and more fun!

### Broader Compatibility

Windows Vista with Service Pack 1 and improvements delivered by our hardware and software partners increase the reliability, performance, and compatibility of Windows Vista-based PCs.

### Increased Reliability

Windows Vista with Service Pack 1 includes improvements that target some of the most common causes of identified system failures, giving users a more consistent Windows Vista experience.

### Tighter Security

Service Pack 1 continues to improve Windows Vista security. It includes previously released updates for security bulletins that affect Windows Vista. It also improves security across many features, such as BitLocker, the Remote Desktop Connection client and smart cards.

### Better Performance

Service Pack 1 further improves Windows Vista performance in response to customer feedback. Improvements include file-copy performance, networking performance, power transition, battery life and more!

### Windows Media Centre ready

## Microsoft Windows Vista Home Premium SP1 Academic Upgrade

Windows Vista Home Premium is the preferred edition for home desktop and mobile PCs. It provides a breakthrough design that brings your world into sharper focus while delivering the productivity, entertainment, and security you need from your PC at home or on the go.

Full (MSA5118) \$327

Full Upgrade (MSA5119) \$187



NEW

**\$113**

SAVE \$26 off RRP  
WebCode: MSA5120

### Flagship Microsoft operating system

## Microsoft Windows Vista Ultimate SP1

Windows Vista Ultimate is the most comprehensive edition of Windows Vista. It is the first operating system that combines all of the advanced infrastructure features of a business. Inherits features of both Home Premium and Business editions of Windows Vista.

Upgrade (MSA5124) \$380



NEW

**\$423**

SAVE \$26 off RRP  
WebCode: MSA5123

### Perfect for 3 home PC's

## Microsoft Office Home and Student 2007\*

Applications included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- OneNote 2007

\*for non-commercial use only



**\$196**

SAVE \$33 off RRP  
WebCode: MSA6101

### For students who need it all

## Microsoft Office Professional 2007 Academic\*

Applications included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- Publisher 2007
- Access 2007
- Outlook 2007 with Business Contact Manager

Full (MSA6108) \$758

Upgrade (MSA6109) \$492

\*for non-commercial use only



**\$287**

SAVE \$12 off RRP  
WebCode: MSA6107

### Best value for small/medium business

## Microsoft Office Small Business 2007

Applications Included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- Publisher 2007
- Outlook 2007 with Business Contact Manager

Upgrade  
(MSA6106) \$437



**\$691**

SAVE \$58 off RRP  
WebCode: MSA6105



## Professional drawing tool

### Microsoft Office Visio Standard 2007

Office Visio Standard 2007 is best for business users who need to visualize, document, communicate, and share ideas using professional looking flowcharts, office layouts, organisation charts, project timelines, and more.

Academic (MSA6151) \$118

Microsoft



**\$387**

SAVE \$57 off RRP  
WebCode: MSA6152

## A project manager's dream

### Microsoft Project Standard 2007

Microsoft Office Project Standard 2007 gives you robust project management tools with the right blend of usability, power, and flexibility, so you can manage projects more efficiently and effectively.

Academic (MSA6141) \$99

Upgrade (MSA6143) \$536

Microsoft



**\$913**

SAVE \$120 off RRP  
WebCode: MSA6142

## Professional Subscription Included – Ideal for professional developers

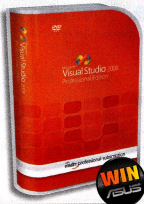
### Microsoft Visual Studio 2008 Professional with MSDN Professional Subscription

MSDN Subscriptions are the ultimate resource for professional developers, teams, and organisations engaged in application development. Comprehensive access to Microsoft tools and technologies enable teams to confidently design, develop and test software solutions; professional support services and expert information resources ensure Developers can rise to the biggest challenges.

#### Key Benefits:

- Visual Studio 2008 Professional
- Previous versions of Visual Studio
- Visual Studio Tools for Office
- Visual SourceSafe
- Operating Systems
- MSDN Library

Microsoft



**\$1814**

SAVE \$270 off RRP  
WebCode: MSA9904

## Perfect all-in-one development product with Office 2007 Ultimate Included

### Microsoft Visual Studio 2008 Professional with MSDN Premium Subscription

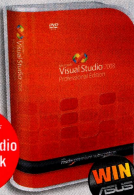
Developers using Visual Studio 2008 Professional Edition can target the Microsoft Office system, Windows Mobile devices, and SQL Server. Visual Studio Tools for Office is now a fully integrated part of Visual Studio 2008 Professional Edition.

#### Key Benefits:

- Visual Studio 2008 Professional
- Office 2007 Ultimate
- Previous versions of Visual Studio
- Expression Web
- Expression Blend
- Visual Studio Tools for Office
- Visual SourceSafe
- SQL Server
- Application Platform Servers
- Business Productivity Servers

\*Limited to the first 20 purchases

Microsoft



BONUS\*  
Visual Studio  
Notebook  
Bag

**\$3793**

SAVE \$562 off RRP  
WebCode: MSA9906

## Expression Web included + more!

### Microsoft Expression Studio

Microsoft Expression Studio, a suite of tools for creative designers that gives you the freedom to bring your vision to life and boosts developer collaboration in the delivery of rich user experiences for the Web, Windows Vista applications and beyond.

#### Key Benefits:

- Expression Web
- Expression Blend
- Expression Design
- Expression Media

Academic (MSS0081) \$154  
Upgrade (MSS0083) \$543

Microsoft



**\$934**

SAVE \$106 off RRP  
WebCode: MSS0082

## Web design in a flash

### Microsoft Expression Web

Build dynamic, interactive pages that harness the power of the Web to deliver superior quality. Built-in support for today's modern Web standards makes it easy to optimise your sites for accessibility and cross-browser compatibility.

#### Key Benefits:

- Standards-based Web Sites
- CSS Based Layout

Academic (MSA9880) \$91  
Upgrade (MSA9882) \$159

Microsoft



**\$483**

SAVE \$40 off RRP  
WebCode: MSA9881





## Entry level business PDF solution

### Adobe Acrobat 8 Standard

Adobe Acrobat 8 Standard software enables business professionals to:

- Combine documents and drawings into a single Adobe PDF document
- Use familiar commenting tools including a highlighter, sticky notes, and more
- Save Adobe PDF files as Microsoft Word documents

Upgrade  
(ALG9520) \$134



**\$376**

SAVE \$139 off RRP  
WebCode: ALD9595

## Essential for the business professional

### Adobe Acrobat 8 Professional

All the features of Acrobat Standard 8 plus:

- Permanently delete sensitive information
- Create PDFs from AutoCAD, Microsoft Visio & Project (Win only)
- Preserve document layers in technical drawings
- Create fillable PDF forms from scanned paper
- Automatically recognise form fields on static PDF documents



**\$559**

SAVE \$216 off RRP  
WebCode: ALD9592

## #1 selling contact manager

### ACT! by Sage 2008 v10

Celebrate the 20th Anniversary of the world's best selling contact and customer manager with the release of ACT! by Sage 2008.

- New interactive dashboard
- Compatibility with Office 2007 and Vista
- Direct integration with Outlook e-mail

Upgrade (TCA0114) \$148

Academic  
(TCA0115) \$178



**\$242**

SAVE \$37 off RRP  
WebCode: TCA0113



## Speech recognition software

### Nuance Dragon NaturallySpeaking 9 Standard

An easy-to-use product that gives you everything you need to get started, including a free high quality headset mic with noise cancelling technology.

Academic

(NUA0021) \$85

\*\$40 Cashback on offer from 15 March 2008 to 30 June 2008

\* See citysoftware.com.au/promotions

3x Faster Than Typing



You Pay \$168  
**\$128**

SAVE \$71 off RRP  
WebCode: NUA0019

After \$40 Cashback\*

## Works with portable devices

### Nuance Dragon NaturallySpeaking 9 Preferred

Dragon NaturallySpeaking Preferred 9 gives small business users and PC enthusiasts the power to create documents, reports, emails and more - all by speaking! Fast, easy & amazingly accurate.

\*\$40 Cashback on offer from 15 March 2008 to 30 June 2008

\* See citysoftware.com.au/promotions



You Pay \$337  
**\$297**

SAVE \$102 off RRP  
WebCode: NUA0017

After \$40 Cashback\*

## Digital Philips recorder included

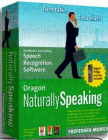
### Nuance Dragon NaturallySpeaking 9 Preferred Mobile

Dragon NaturallySpeaking Preferred Mobile 9 includes all features of the Preferred version with the added twist being the inclusion of a Philips digital recorder included in the box. Ideal for the professional executive, this will make your business life more efficient and you won't miss a word.

You Pay \$591  
**\$516**

SAVE \$183 off RRP  
WebCode: NUA0016

After \$75 Cashback\*



## Quick and easy PDFs

### Nuance PDF Create 5

Create PDF files from all of your documents with just a click of the mouse, thanks to PDF Create. Now it's easier than ever to share information or archive important files using the PDF format. Create documents up to 3 times faster than with other PDF applications, with results that are universally viewable from virtually any PDF viewer.



**\$57**

SAVE \$12 off RRP  
WebCode: NUA0062

## Create, convert & edit PDFs fast!

### Nuance PDF Converter Professional 5

PDF Converter Professional 5, the only complete PDF solution designed specifically for business users, delivers everything you need to create, convert, and edit PDF files.

\*\$40 Cashback on offer from 15 March 2008 to 30 June 2008

\* See citysoftware.com.au/promotions



You Pay \$157  
**\$117**

SAVE \$78 off RRP  
WebCode: NUA0064

After \$40 Cashback\*

## Precision OCR scanning & PDF tools

### Nuance OmniPage Professional 16

Allows business professionals to achieve new levels of productivity by eliminating the manual reproduction of documents.

- Precision OCR analysis
- Advanced security features

Upgrade

(NUA0047) \$328

\*\$75 Cashback on offer from 15 March 2008 to 30 June 2008

\* See citysoftware.com.au/promotions



You Pay \$797  
**\$722**

SAVE \$277 off RRP  
WebCode: NUA0046

After \$75 Cashback\*





## FileMaker in use - Allied Express

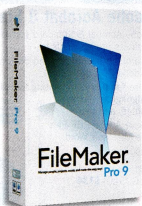
Allied Express tracks sales performance and reduces reporting time by 30 hours a week! In today's competitive business climate, sales teams need instant access to detailed information including pipelines, close rates, major opportunities, key customers, sales figures and forecasts. A centralised database is also vital for marketing purposes and can increase efficiency by enabling certain groups of customers to be targeted at one time.

Allied Express is the largest, independently owned courier and express freight company in Australia. It's fleet of over 1000 vehicles covers the entire country with a comprehensive range of fast, efficient express transport services ranging from the inner city bicycles to line-haul vehicles.

Allied Express selected FileMaker developer Macumen to create a solution that would enable its sales teams to be more productive and measure

its sales performance. The solution based on FileMaker Pro enables Allied Express to access staff performance and competitor information that was never available before, the sales teams can be coordinated nationally and now customer trading data is available daily – where as previously it was aggregated weekly. Time spent preparing data for reports has been reduced by about 30 hours per week and sales agreements are now stored within the system, allowing instant retrieval.

"The FileMaker solution has brought real structure to Allied's new-business prospecting. It has helped us lift our game and our bottom line. Processing of raw leads into prospects, converting prospects into appointments and ultimately appointments into sales is now a fluid, totally managed process," said Garry Anderson, General Manager Sales & Marketing, Allied Express.



**\$477**

**SAVE \$22 off RRP**  
WebCode: FIL2000

## Customise your database

### FileMaker Pro 9 Advanced

FileMaker Pro 9 Advanced includes all the features of FileMaker Pro 9 plus a suite of advanced development and customisation tools to help you design and develop more powerful, more customised database solutions faster and easier than ever before!

**Upgrade**  
(FIL2007) **\$473**



**\$756**

**SAVE \$43 off RRP**  
WebCode: FIL2006

## Share your database with ease

### FileMaker Server 9 Upgrade

FileMaker Pro has outstanding peer-to-peer sharing built right in. So why add a server? There are three key reasons: expanded availability, enhanced security and increased performance.

**Upgrade**  
(FIL2010) **\$939**



**\$1578**

**SAVE \$67 off RRP**  
WebCode: FIL2009



**FileMaker.**

## Annual Volume License Agreement (AVLA)

**Who should purchase this type of license?**  
**Organisations that need at least 10 licenses.**

### Benefits:

- Save over 13% off single user packages
- Includes 12 months maintenance
- No minimums for adding seats to an existing AVLA

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## The industry standard

### Crystal Reports 2008

Put new power in the hands of business users. Empower them to make multiple decisions from one report, run their own "what-if" scenarios and get more report views, instantly. So you're free from writing numerous reports and updates which are tasks that can have real impact on your department's productivity.

**Upgrade**  
(SCR2009) **\$452**



**NEW**



**\$757**

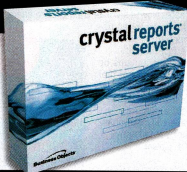
**SAVE \$32 off RRP**  
WebCode: SCR2008

## SAVE TIME AND MONEY WITH CRYSTAL

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### Crystal Reports Server

Still emailing reports? There's an easier way. Get information to users faster – in a simple, secure environment. Make everyone's life easier and try Crystal Reports Server. Create, manage and securely deliver reports over the web, and save thousands with this limited time offer.



**Trust your data and save up to \$22,500 on Crystal Reports Server.**

**Prices start from \$9,488 (5 CAL)**

\* Offer available until June 25 2008.



## Photo &amp; video editing

## Corel Paint Shop Pro Photo X2 + Ulead VideoStudio 11.5 Plus

Buy both &amp; save!

Corel Paint Shop Pro Photo X2 (COR9000) \$129

New Corel Paint Shop Pro Photo X2 is the ideal choice for any aspiring photographer's digital darkroom. It's filled with everything from easy automatic photo fixes to precision editing tools. It even includes a built-in Learning Center to help new users get started right away!

Ulead VideoStudio 11.5 Plus for Windows (ULE0117) \$173

All the editing and authoring tools found in the standard version, PLUS unique and powerful features including full HD DVD authoring, AVCHD support, Dolby Digital 5.1 surround sound and a full set of easy corrective and creative filters. VideoStudio Editor gives you all the tools you need to produce great-looking home movies.

COREL



HOT BUNDLE

\$199

SAVE \$40 off RRP  
WebCode: COR0103

## Convert videos for iPod &amp; more

## Corel DVD Copy 6 Plus

Corel DVD Copy 6 Plus makes copying DVDs and converting video easy. Enjoy full disc copying features. Convert video in three simple steps for sharing by email, on the Web, iPod, iPhone, PSP, Zune, mobile phone or portable media player. Easy, fast and reliable. Corel DVD Copy 6 Plus lets you take your video where you want to go.

COREL



\$71

SAVE \$8 off RRP  
WebCode: CRL0001

## Edit new HD video formats

## Sony Vegas Movie Studio Platinum Edition 8

- Edit standard and HD video including DV, HDV, and Sony AVCHD
- Make professional-looking DVDs
- Export movies directly to your PSP
- Learn as you go with Show Me How tutorials
- Create 5.1 surround sound

SONY



\$194

SAVE \$45 off RRP  
WebCode: SON0071

## \$100 off full version promotion

## Pinnacle Studio 11 Ultimate Full Version Crossgrade

- Capture from analog and digital sources
- Convenient scaling user interface
- HiFi music generation
- One-click web upload to Yahoo Video
- HDV & AVCHD support
- Windows Vista Compatible

Upgrade  
(PIN0175) \$132

pinnacle



\$191

SAVE \$108 off RRP  
WebCode: PIN0177

## Recording studio in your home

## Sony ACID Music Studio 7

- Record, edit, and mix multiple tracks of audio and MIDI
- Unique interactive tutorials so you can learn while you work
- Includes over 3,000 ACIDised music loops and 1,000 MIDI files
- Share songs any way you want including CD and MP3

SONY



\$132

SAVE \$37 off RRP  
WebCode: SON0069

## Copy discs with just one click

## Nero 8

- Direct access to all features from the project launcher
- High Definition format support
- Xbox 360 and PlayStation 3 streaming features
- Blu-ray Disc and HD DVD burning support
- Graphics optimised for Windows Vista



nero

\$154

SAVE \$45 off RRP  
WebCode: NERO028

## Ignite your digital life

## Roxio Easy Media Creator 10

Express yourself digitally and capture, organise, edit, enhance, protect, share and enjoy all your photos, video and music. Copy audio, movies and TV shows from any iPod to your PC. Burn to HD DVD and Blu-ray and much more!

BONUS  
Sandisk 1GB  
USB Drive

roxio

\$134

SAVE \$45 off RRP  
WebCode: ROX5002

## Ideal for professional video editing

## Sony Vegas Pro 8

- Professional video and audio production software
- Real-time editing and processing of SD and HD video
- Superior audio control including new mixing console
- Advanced DVD authoring tools
- Comprehensive XDCAM workflow

SONY



\$679

SAVE \$70 off RRP  
WebCode: SON0085





## Professional looking photos fast

### Corel Paint Shop Pro Photo X2

New Corel Paint Shop Pro Photo X2 is the ideal choice for any aspiring photographer's digital darkroom. It allows you to:

- Process photos like the pros
- Edit easily using unique tools
- Enhance photos with powerful, easy-to-use tools
- Create one-of-a-kind photos

**Upgrade**  
(COR9001) **\$82**



COREL

**\$129**

**SAVE \$70 off RRP**  
WebCode: COR9000

## New & improved Corel Graphics Suite

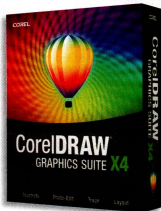
### CorelDRAW Graphics Suite X4

CorelDRAW Graphics Suite X4 lets you tackle creative graphics and design projects with confidence. New tools make it easier and quicker than ever to deliver any creative project, from layout and photo editing, to illustration and bitmap-to-vector tracing.

- New modernised user interface
- New templates, clipart images, photos and more
- Live text formatting
- Online training with CorelTUTOR
- Advanced image-editing features (including RAW files)
- Collaborate with colleagues and clients using CorelDRAW ConceptShare
- Closely match colours between Corel, Microsoft and Adobe applications
- Enhanced Windows Vista integration

**Student & Teacher** (COR8972) **\$132**  
**Upgrade** (COR8971) **\$254**

COREL



**\$548**

**SAVE \$281 off RRP**  
WebCode: COR8968

## Desktop publishing made simple

### QuarkXPress 7

QuarkXPress 7 includes more than 160 new and enhanced features to enable you to work faster and smarter. A new independent report from Ron Roszkiewicz Consulting quantifies this claim and concludes that QuarkXPress 7 offers the highest productivity in both design-intensive and production-intensive workflows.

**Academic**  
(QUA0045) **\$235**



**\$1375**

**SAVE \$124 off RRP**  
WebCode: QUA0040

## Industry standard photo editing

### Adobe Photoshop CS3 Extended

Get everything and more with Photoshop CS3 Extended, which enables you to edit 3D and motion-based content and perform image analysis.

- Features include:
- Smart Filters
  - 3D compositing and texture editing
  - 2D and 3D measurement tools

**Academic**  
(AEP0064) **\$379**

**Student**  
(ADS0017) **\$216**



**\$1337**

**SAVE \$398 off RRP**  
WebCode: ALD0095

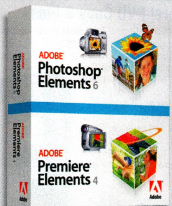
## Top selling photo & video editing @ home

### Adobe Photoshop Elements 6 & Premiere Elements 4

Adobe Photoshop Elements 6.0 plus Adobe Premiere Elements 4.0 software combines two powerful yet easy-to-use products to deliver the most complete photo and video editing solution. Adobe Photoshop Elements 6 software combines power and simplicity so you can make your photos look their best, easily find and view all your photos and video clips. Adobe Premiere Elements 4 software lets you share your movies on YouTube, Blu-ray Disc and virtually anywhere else. Additional features include:

- Add video-style effects to photo slide shows and then share them on disc or the web
- Create dramatic video freeze-frame effects and turn individual frames into disc covers and labels
- Excellent value for money!

**Academic** (AEP9533) **\$132**



**\$198**

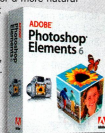
**SAVE \$51 off RRP**  
WebCode: ALD9600

## Touch up family memories

### Adobe Photoshop Elements 6

Create amazing composites with easy-to-use tools. Brush away wrinkles, unwanted objects, and other flaws. Make selections in a snap so you can easily adjust specific areas of a photo. Easily adjust skin tones for a more natural look. Keep every photo at your fingertips and show off your creativity in entertaining slide shows, photo mail, web galleries, and countless other ways.

**Academic**  
(AEP9532) **\$93**



**\$137**

**SAVE \$32 off RRP**  
WebCode: ALD9599

## Corel Painter Essentials 3 included

### Corel Ulead PhotoImpact X3

Ulead PhotoImpact X3 combines full-featured photo editing with inspiring photo projects and amazing digital art to make digital photography and image creativity fun, fast and easy.

- Automated easy & expressix mode for colour, exposure and composition
- Take your photos to new places
- Create amazing digital art
- Graphics tools for Video Enthusiasts

COREL



**\$105**

**SAVE \$14 off RRP**  
WebCode: ULE0118





### A graphic design must

## Adobe Creative Suite 3 Design Premium for Windows

Let your ideas take flight with Adobe Creative Suite 3 Design Premium, which equips you to craft your best creative work more easily and efficiently than ever before. From thinking through concepts to finessing production details, you can leverage the intuitive tools in Creative Suite 3 Design Premium to make even your most visionary ideas real.

#### Includes:

- InDesign CS3
- Photoshop CS3 Extended
- Illustrator CS3
- Flash CS3 Professional
- Dreamweaver CS3
- Acrobat 8 Professional

**Academic - Win (AEP0037) \$798**

**Upgrade - Win (ALG1027) \$837**

**Student - Win (ADS0007) \$419**

Mac versions also available see page 17.



**\$2378**

**SAVE \$741 off RRP**  
WebCode: ALD0069



### Economical design suite

## Adobe Creative Suite 3 Design Standard Windows

#### Includes:

- Acrobat 8 Professional
- InDesign CS3
- Photoshop CS3
- Illustrator CS3

**Academic - Win (AEP0039) \$498**

**Upgrade - Win (ALG1031) \$563**

**Student - Win (ADS0009) \$280**

Mac versions also available.



**\$1658**

**SAVE \$421 off RRP**  
WebCode: ALD0071

### Perfect for audio visual production professionals

## Adobe Creative Suite 3 Production Premium Windows

Adobe Creative Suite 3 Production Premium software, the successor to Adobe Production Studio, enables exceptional productivity as you create visually innovative work for film, broadcast, web, mobile phones, and other portable devices.

#### Includes:

- Adobe After Effects CS3 Professional
- Adobe Premiere Pro CS3
- Adobe Photoshop CS3 Extended
- Adobe Flash CS3 Professional
- Adobe Illustrator CS3
- Adobe Soundbooth CS3
- Adobe Encore CS3

**Academic - Win (AEP0044) \$812**

**Upgrade - Win (ALG1039) \$1196**

**Student - Win (ADS0013) \$422**

Mac versions also available see page 17.



**\$2333**

**SAVE \$616 off RRP**  
WebCode: ALD0075



### Economical web design suite

## Adobe Creative Suite 3 Web Standard Windows

#### Includes:

- Dreamweaver CS3
- Flash CS3 Professional
- Fireworks CS3
- Contribute CS3

**Academic - Win (AEP0048) \$494**

**Upgrade - Win (ALG1047) \$548**

**Student - Win (ADS0015) \$282**

Mac versions also available.



**\$1336**

**SAVE \$399 off RRP**  
WebCode: ALD0079

### The ultimate all-in-one package

## Adobe Creative Suite 3 Master Collection Windows

Follow your ideas anywhere with Adobe Creative Suite 3 Master Collection software. A comprehensive creative environment featuring highly integrated, exceptionally productive tools for designing for print, web, interactive, film, video, and mobile devices. Master Collection is a value-packed offering that helps you meet deadlines while you explore and express your creative ideas.

#### Includes:

- InDesign CS3
- Photoshop CS3 Extended
- Illustrator CS3
- Flash CS3 Professional
- Dreamweaver CS3
- Fireworks CS3 Professional
- Contribute CS3
- After Effects CS3
- Premiere Pro CS3
- Soundbooth CS3
- Encore CS3
- Acrobat 8 Professional

**Academic - Win (AEP0042) \$1236**

**Upgrade - Win (ALG1036) \$1868**

**Student - Win (ADS0011) \$697**

Mac versions also available see page 17.



**\$3363**

**SAVE \$972 off RRP**  
WebCode: ALD0073



### Ideal for web professionals

## Adobe Creative Suite 3 Web Premium

#### Includes:

- Dreamweaver CS3
- Flash CS3 Professional
- Photoshop CS3 Extended
- Illustrator CS3
- Fireworks CS3
- Acrobat 8 Professional
- Contribute CS3

**Academic - Win (AEP0046) \$625**

**Upgrade - Win (ALG1043) \$679**



**\$2132**

**SAVE \$643 off RRP**  
WebCode: ALD0077

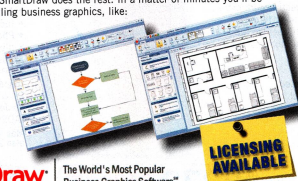


Create presentation quality graphics in minutes, not hours

## SmartDraw 2008

SmartDraw gives you the power to create the graphics you need to succeed, fast. With SmartDraw you start by selecting the exact template you want from over a hundred different types. Then use simple commands to add your information and SmartDraw does the rest. In a matter of minutes you'll be using SmartDraw to create clear, compelling business graphics, like:

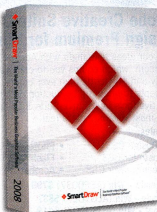
- Flowcharts
- Bar Graphs and Pie Charts
- Project Timelines
- Gantt Charts
- Floor Plans
- Venn Diagrams
- Scheduling Calendars
- Org Charts
- Marketing Charts
- Forms
- And more



**SmartDraw**

The World's Most Popular Business Graphics Software™

**LICENSING AVAILABLE**



**\$225**

WebCode: SMT0035

Unleash your creative flair

## Punch! Landscape, Deck & Patio v12

The new Punch! Landscape, Deck and Patio Designer is more than just a landscaping product. It brings your style and outdoor living ideas to life! Looking to build an outdoor barbecue? Fireplace? Or update your outdoor living space with the latest designs?

Here is the answer.



**\$88**

SAVE \$11 off RRP  
WebCode: PUN0024

Design your dream home

## Punch! Home Design Platinum v12

Punch! Professional Home Design Platinum version 12, continues to expand on its already incredible capabilities! Both landscape and home design options are boundless, in this easy-to-use, two-for-one software package. Now with improved performance and expanded feature set, it remains the perfect software for the beginner to the expert!



**\$136**

SAVE \$13 off RRP  
WebCode: PUN0023

Super fast 3D walk-throughs

## Punch! Home Design Architectural Series 5000

Punch! Architectural Series 5000 is a quantum-leap in performance and realism over any other competitive product. Its 3D redraw speeds are up to FOUR times faster than the competition allowing Hollywood-style walk or fly-through in real time! You'll be amazed at the power, versatility, realism you'll have at your fingertips!



**\$357**

SAVE \$42 off RRP  
WebCode: PUN0025



Perfect for architects, builders and more

## IMSI TurboFloorPlan Home Designer

- Bring your home or remodel ideas to life with realistic 3D visualisation tools
- Start from scratch using the powerful House Builder Wizard
- Metric or Imperial measurement
- Easily customise interior walls, windows, colours, furniture and lighting
- Visualise your dream in 3D Realview



**\$79**

SAVE \$10 off RRP  
WebCode: BRD0040

Ready to read AutoCAD files

## IMSI TurboCAD 15 Deluxe 2D/3D

- Unlimited design options with hundreds of professional drafting and design tools
- Incredible file support for over 30 file formats including AutoCAD
- Video and interactive tutorials
- Photorealistic rendering and millions of symbols
- Perfect for architects, illustrators, contractors, builders, students, engineers and hobbyists



**\$178**

SAVE \$21 off RRP  
WebCode: IMS0043



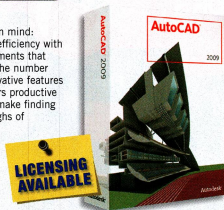


## Professional 2D/3D industry standard CAD software

## Autodesk AutoCAD 2009

With AutoCAD software Autodesk has just one goal in mind: increasing your productivity. AutoCAD 2009 boosts efficiency with customisable and extensible user interface enhancements that increase overall drafting productivity by decreasing the number of steps to reach a command. Newly designed, innovative features simplify working with layers and help make new users productive as quickly as possible. Easy-to-use navigation tools make finding your way around 3D models a snap. Move to new highs of productivity with AutoCAD software.

**Subscription (AUT0198) \$716**  
**Upgrade from 2008 (AUT0189) \$1599**  
**Upgrade from 2007 (AUT0190) \$2491**  
**Upgrade from 2006 (AUT0191) \$3378**  
**Student Edition - 13 Months (AUT0203) \$157**

**\$6314****SAVE \$726 off RRP**  
WebCode: AUT0196

## Autodesk®

## Autodesk Subscription

**Simplify your technology upgrades and boost your design productivity with the complete software, support, and training package from Autodesk Subscription.**

Autodesk Subscription is a maintenance program giving you access to Autodesk's latest software releases and enhancements that keep your design tools up-to-date and make the most of your software investment. With software extensions, downloadable e-courses, a single contract number to manage your software, and the option of Autodesk Direct Online Support, you can simplify your software upgrades and minimize disruptions to your workflow.

Get up to date and up to speed now with Autodesk Subscription. All this for a single annual fee when you buy AutoCAD 2009 or AutoCAD LT 2009 software.



## Autodesk®

The world's best selling 2D drafting and detailing tool

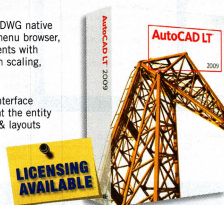
## Autodesk AutoCAD LT 2009

AutoCAD LT software simplifies daily tasks with full DWG native file format compatibility, the new ribbon interface, menu browser, and enhanced layer dialog. Couple these enhancements with existing features like Dynamic Blocks and annotation scaling, and your job just keeps getting easier.

## New features include:

- Ribbon – Easily learn and use with this updated interface
- Quick Properties – View key property information at the entity
- Quick View – thumbnail images of open drawings & layouts

**Upgrade (AUT0194) \$1089**  
**Subscription (AUT0195) \$363**

**\$1977****SAVE \$223 off RRP**  
WebCode: AUT0193

## Autodesk®

## 3D digital prototyping

## Autodesk AutoCAD Inventor Professional 2009 Student Edition

Autodesk Inventor software provides a comprehensive set of design tools for producing, validating, and documenting complete digital prototypes. The Inventor model is a 3D digital prototype that helps users to visualise, simulate, and analyse how a design will work under real-world conditions before a product or part is ever built.

**\$157****SAVE \$8 off RRP**  
WebCode: AUT0206

## Building made easy

## Autodesk AutoCAD Revit Architecture Suite 2009 Student Edition

With industry-leading AutoCAD software and the benefits of the Revit Architecture building information modelling (BIM) application, your software, training, and design data investments are protected while you move to BIM at your own pace.



## Autodesk®

**\$157****SAVE \$8 off RRP**  
WebCode: AUT0204

## Precision drawing @ home

## Autodesk AutoSketch 9

AutoSketch software provides a complete set of CAD tools for creating professional-quality precision drawings. A series of tutorials get you up and running fast. A Microsoft Windows XP, like interface provides a familiar environment for straight forward drafting.



## Autodesk®

**\$262****SAVE \$13 off RRP**  
WebCode: AUT0077





**QBI** series

**QuickBooks®**  
The world's best selling accounting software

**PC USER  
BEST BUY**

**NEW RANGE  
FOR 2008/09**

**QuickBooks  
EasyStart**



Designed for first-time users needing a simple accounting solution. Simple and practical tools make it easy to manage all essential business tasks.

- Easy to learn and use
- Cash-based accounting
- Manage GST and BAS
- Track sales & expenses
- Invoice & pay bills

**QuickBooks  
Accounting**



A powerful software package specifically designed for small businesses that need to track their finances, but don't require payroll.

- Inventory Management
- Track GST and lodge BAS online
- Process credit card payments
- Import bank statements
- Manage sales and customers
- Easy to set up and use

**QuickBooks  
Plus**



Time saving features and powerful functionality make this a must-have for efficiency-minded businesses that manage inventory and track payroll.

- Integrated payroll management
- Track and manage inventory
- Track GST and lodge BAS online
- Process credit card payments
- Import bank statements
- Produce business reports
- Easy to set up and use

**QuickBooks  
Pro**



Lets you prepare quotes and estimates, integrate seamlessly with Microsoft® Office and has advanced tools to help you analyse key projects.

- Measure time billing and job costing
- Design and customise forms
- Integrate with Microsoft Office®
- Automatically track Units of Measure Sets
- Integrated payroll management
- Track and manage inventory
- Track GST and lodge BAS online
- Process credit card payments
- Import bank statements
- Produce business reports

**QuickBooks  
Premier**



Industry-specific editions incorporate tools and reports designed to meet your specialised needs, while fast multi-user capability and performance help increase your business efficiency.

- Multi-user access
- Industry specific editions
- Advanced reporting tools
- Measure time billing & job costing
- Integrate with Microsoft Office®
- Automatically track Units of Measure Sets
- Integrated payroll management
- Track and manage inventory
- Track GST and lodge BAS online
- Process credit card payments
- Import bank statements



2007 "Best-SME SME Accounting Software" - Australian PC User Magazine  
2006 "Top Buy" - Australian PC User Magazine  
2005 "Sales Army/kings of SME software" - In The Black Magazine

2004 "Best SME Accounting package" - Australian PC User Magazine  
2003 Budgeting feature - "the best we've ever seen" - Personal Computer Magazine  
2002 Data entry feature - "the fastest we've seen..." - Personal Computer Magazine

brought to you by  
**Reckon**

**\$129**

SAVE \$10 off RRP  
WebCode: QUI0150

**\$277**

SAVE \$22 off RRP  
WebCode: QUI0151

**\$524**

SAVE \$55 off RRP  
WebCode: QUI0152

**\$759**

SAVE \$90 off RRP  
WebCode: QUI0153

**\$1298**

SAVE \$101 off RRP  
WebCode: QUI0154

Point of Sale made easy

## Reckon Retail Point of Sale Professional 2008/09

Advanced features that allow you to track sales, inventory, customers and accounting, set up promotions and customer loyalty programs, as well as kitchen printing, table tracking and much more.

- Seamless integration to QuickBooks QBI series
- Touch screen enabled
- Manage your stock with ease
- Manage customer accounts and laybys



**NEW**  
Released late April

Reckon

**\$698**

SAVE \$101 off RRP  
WebCode: QUI0163

The all-in-one POS & Accounting Solution

## Reckon Retail Starter Kit 2008/09

If you are opening your store for the first time, or upgrading from a cash register, then Reckon's **Retail Starter Kit** is what you need. Finding the right software is one thing but then having to find the point of sale hardware that is compatible with your software is another. The Retail Starter Kit has been designed to make getting started easy.

- Point of sale and back office management
- Integrated EFTPOS
- Compatible with MS Win 2000/XP/Vista
- Customer management tools
- Touch Screen enabled
- Inventory management

**Kit Includes:**

- QuickBooks Plus 2008/09 QBI Series
- Retail Point of Sale Lite 2008/09
- Thermal Printer, Scanner & Cash Drawer
- 12 months free technical phone support
- 12 months free Upgrades



Reckon

**\$893**

SAVE \$106 off RRP  
WebCode: QUI0162

**NEW**  
Released late April

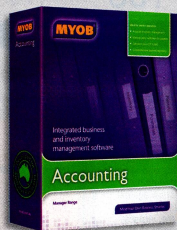
## For professional owner-operators

### MYOB Accounting 17

With MYOB Accounting's inventory management system you'll know what's in stock, what's on order and what's committed. The inventory management system is integrated with the sales and purchasing features, so your stock listing is always up to date and accurate.

MYOB Accounting helps save you time and money by providing instant access to detailed lists of unpaid customer invoices, bank balances and transactions using the Bank Register, customisable invoices for printing on plain paper, customer trading history, complete stock audit trails and low stock level alerts...and much more.

Upgrade (MYB0078) \$228



## Integrated payroll & time billing

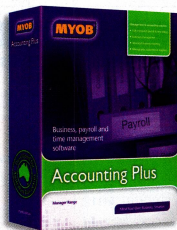
### MYOB Accounting Plus 17

With an award-winning integrated payroll, MYOB Accounting Plus is the ideal single-user business management and accounting solution for small employers. MYOB Accounting Plus makes it easy to track and charge for your time and manage your inventory, and provides easy access to powerful profit-building information about your business.

It has the same business management features as MYOB Accounting Plus, it also

- Automates your Pay Runs
- Calculates PAYG withholdings
- Works out your superannuation and then updates all your accounts automatically

Upgrade (MYB0079) \$299

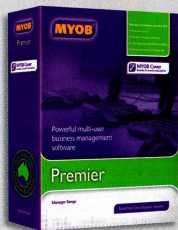


## 3 user package

### MYOB Premier 11

MYOB Premier gives you the power to manage even the most complex medium-sized business. Get the complete set of business management features as found in MYOB Accounting Plus and also handle transactions and accounts in multiple currencies. Multiple people can access your business information at the same time, which can help make your processing more efficient. For example, someone can enter a sale while someone else prints a report or enters a cheque - think of the time you'll save!

MYOB Premier is also issued with one full year of access to software support and upgrades.



MYOB

\$287

SAVE \$62 off RRP  
WebCode: MYB0074

Ideal for sole traders

### MYOB BusinessBasics

Manage all your basic business tasks from the one easy program, designed specifically for small or home-based Australian businesses.

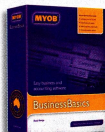
Streamline the data entry and reconciliation side of managing your business with MYOB Business Basics, and free up your time to focus on running it. MYOB Business Basics is ideal if you:

- Run a small or home based business
- Employ no staff
- Have no inventory

MYOB

\$128

SAVE \$21 off RRP  
WebCode: MYB0004



MYOB

\$478

SAVE \$117 off RRP  
WebCode: MYB0075

Point of sale in a box

### MYOB RetailReady

MYOB RetailReady contains all the software and hardware you need to turn your PC into an effective Point of Sale (POS) solution. RetailReady processes sales fast, reports GST and performs "Cash Ups" in just a few clicks.

Includes:

- MYOB Retail Basics, Barcode Scanner, Thermal Docket Printer and Electronic Cash Drawer



MYOB

\$872

SAVE \$127 off RRP  
WebCode: MYB0040

MYOB

\$1346

SAVE \$149 off RRP  
WebCode: MYB0077

Advanced retail POS software

### MYOB RetailManager v10

Our retail software is designed, developed and tested in close collaboration with existing retail businesses. By automating many of your key store procedures and processes.

- Process sales fast, including lay-bys and accounts
- Manage your inventory
- Identify where you're making money
- Comprehensively manage pricing



MYOB

\$1695

SAVE \$295 off RRP  
WebCode: MYB0082





## Symantec corporate solutions

### Symantec Backup Exec 12

Symantec Backup Exec 12 delivers efficient, easy-to manage backup and recovery protection from server to desktop, providing optimised data protection for Windows based environments, now supporting Microsoft Windows Server 2008. With granular recovery features and continuous data protection for critical Microsoft applications, Symantec Backup Exec helps ensure that business-critical data is efficiently protected and can be quickly recovered down to an individual email or document.

To evaluate Symantec Backup Exec 12 visit [www.symantec.com.au/citysoftware-be](http://www.symantec.com.au/citysoftware-be)



### Symantec Backup Exec System Recovery 8

Symantec Backup Exec System Recovery 8 is the gold standard in complete Windows system recovery with the ability to restore systems in minutes, not hours or days, even to dissimilar hardware or virtual environments. It features flexible offsite protection and enhanced recovery capabilities, integration with Symantec security and systems management solutions, and support for Windows Server 2008.

To evaluate Symantec Backup Exec System Recovery 8 visit [www.symantec.com.au/citysoftware](http://www.symantec.com.au/citysoftware)



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[licensing@citysoftware.com.au](http://licensing@citysoftware.com.au)

## Fast PC & internet security in a box!

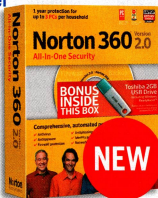
### Norton 360 2.0 All-In-One Security 3 User

Easy security, backup and tuneup for up to 3 PCs. New identity protection, wireless security, more backup options, even better speed and PC performance. Includes 2GB of secure online storage for your files.

#### Features include:

- Easy security, backup and tuneup for up to 3 PCs
- Award-winning antivirus, antispyware and firewall protection
- Stronger protection as you shop and bank online
- New wireless network security features
- Flexible backup options now include HD-DVD, Blu-ray Disc, iPod
- 2GB of secure online storage also included
- Fixes problems that slow your PC - plus fast access to free online help

**BONUS** Toshiba 2GB USB Drive including Windows ReadyBoost  
While stocks last!



symantec.

**\$106**

**SAVE \$23 off RRP**  
WebCode: SYM9929

## Efficient antivirus solution

### Norton AntiVirus 2008 10 User

New & improved! Norton AntiVirus 2008.

- Award-winning protection against spyware, viruses and worms
- Easy install, faster scanning
- Fast access to free online help

1 User (SYM9760) **\$41**  
3 User (SYM9766) **\$74**  
5 User (SYM9767) **\$111**



**\$164**

**SAVE \$35 off RRP**  
WebCode: SYM9768



## Faster than ever before

### Norton Internet Security 2008 5 User

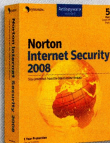
New & improved! Norton Internet Security 2008

- Easier install
- Lighter on your PC
- Fast access to free online help
- Essential for online banking and shopping
- Award-winning protection against identity theft, spyware, viruses and more!



**\$124**

**SAVE \$25 off RRP**  
WebCode: SYM9770



## It's back and better than ever

### Norton Ghost 14.0

Full system backup - Backs up everything on a hard drive or partition

#### New Features Include:

- FTP backup
- Offsite backup
- Symantec ThreatCon integration
- Exclusive Google Desktop integration
- Exclusive Remote management tool



**\$87**

**SAVE \$12 off RRP**  
WebCode: SYM9911



## Keep your system running smoothly

### Norton SystemWorks 11.0 Premier Edition

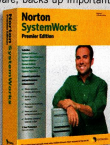
Norton SystemWorks Premier Edition protects against viruses and spyware, backs up important files, and repairs and maintains PCs.

- Norton AntiVirus 2008
- Norton Save & Restore 2.0
- Norton Utilities
- One-Button Checkup
- System Optimiser
- Performance Test



**\$79**

**SAVE \$20 off RRP**  
WebCode: SYM9789





Features keystroke encryptions, exclusive to Trend Micro

## Trend Micro Internet Security Pro 2008 3 User

Complete protection home and away

Whether you are at home or on the go, Trend Micro Internet Security Pro safeguards your online transactions, identity, and irreplaceable files with the most comprehensive protection available. Get all the benefits of our proven Internet security plus enhanced identity theft protection, Wi-Fi validation, data theft protection, and system recovery.

- Includes Firewall, Antivirus & Spyware detection and removal
- New System Restore
- 3 User License

BONUS USB 2.0 Digital TV Receiver when you purchase Trend Micro Internet Security Pro 2008



**\$98**

SAVE \$31 off RRP  
WebCode: TRM0017

Built with Vista in mind

## Microsoft Windows Live OneCare 2.0 3 User

Help get peace of mind knowing that everything is managed for your virus and spyware scanning, firewalls, tune-ups, file backups, the whole nine yards. And it's all delivered to you in a smooth, hassle free package.



Microsoft

**\$68**

SAVE \$31 off RRP  
WebCode: MSA5110

Powerful backup thats easy to do

## Acronis True Image 11 Home

A complete data protection suite – backup your entire PC, your data, and your OS and applications.

- Try and Decide: easy rollback of system changes.
- Smart Scheduling: start backup when user is idle, login/logout and other events.
- Protect your archives with password-based encryption.



**\$68**

SAVE \$11 off RRP  
WebCode: MAN0102

Defrag tool for a faster computer and healthy PC

## Raxco PerfectDisk 2008 Professional

Every time you use your computer, even when it's brand new, the files on your PC or laptop will continuously become fragmented. This means that these files are split into millions of pieces, and this occurs even more so when you go to add, modify and delete them. This makes using your computer, and doing everything you want, much slower than it should be. Fragmentation also leads to much slower boot times and will make applications run slow or even potentially cause them to "lock-up" or freeze.

Raxco PerfectDisk 2008 will put the pieces of your files back together into a single piece - the way they should be. A defragmented computer will boot quicker, files will be accessed faster, and your applications will not hang. Other features of PerfectDisk 2008 include:

- Fragmenter – Graphically shows how fragmented your drive is
- Space Explorer – Easily find large files to recapture valuable space
- 64-bit Compatible
- Corporate & Server Products also available



**\$44**

WebCode: RAX0025

Internet security & data protection

## CA Internet Security Suite Plus 2008 3 User



Comprehensive Internet Security and Data Protection

- Anti-Virus
- Anti-Spyware
- Personal Firewall
- Anti-Spam
- Anti-Phishing
- Parental Controls
- Data Backup and Transfer



You Pay \$54  
**\$24**  
After \$30 Cashback

SAVE \$45 off RRP  
WebCode: CHY2057

Free 24/7 chat & email support

## BullGuard Internet Security Suite 8.0 - 3 User

Daily updates, fast scan times, small footprint anti-spam, anti-phishing, anti-spyware. You can also backup with secure 5Gb online storage and idle backup feature and scheduling. Integrates with Windows explorer.

Now with remote assistance!



**\$79**

SAVE \$19 off RRP  
WebCode: BUL0007





300+ new features

## Apple Mac OS X Leopard

Add a new Mac to your Mac. Mac OS X v10.5 Leopard is packed with over 300 new features, installs easily, and works with the software and accessories you already have. Choose a single-user license for home or office. Alternatively if you have more than one Mac at home, choose the 5 user Family Pack.



**5 User**  
(APPO349) **\$236**

Apple Authorised Reseller

**\$148**

**SAVE \$10 off RRP**  
WebCode: APP0350

3 user home office suite

## Microsoft Office 2008 for Mac Home and Student Edition

The perfect Office for families and students. Microsoft Office 2008 for Mac Home and Student Edition is more powerful and easier to use, helping you to achieve more and simplify your day, for less. New features, intuitive new look and compatibility with Office for Windows will unleash your productivity at a budget-friendly price.



**\$198**

**SAVE \$31 off RRP**  
WebCode: MSA3770

Entry level work suite

## Apple iWork 08 for Mac

Apple's amazing productivity suite for the Mac, iWork '08 includes three applications: Pages '08 for word processing with an incredible sense of style; Numbers '08 for powerful, compelling spreadsheets made easy; and Keynote '08 for cinema-quality presentations for everyone.



**5 User**  
(APPO326) **\$121**

Apple Authorised Reseller

**\$93**

**SAVE \$6 off RRP**  
WebCode: APP0325

Run Windows Vista on your Mac

## Parallels Desktop 3.0 for Mac

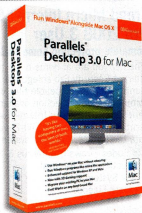
Enables you to run Windows, Linux, and more side-by-side with Mac OS X on any Intel-powered Mac, without rebooting. With Parallels' award-winning virtualisation technology, you can run Mac OS X and your favorite Windows applications at the same time. You can even drag-and-drop files between desktops!

- Use Windows and Mac OS X at the same time... without rebooting
- Run Windows programs like native Mac applications with Parallels Coherence
- Open Windows files with Mac programs and Mac files in Windows programs with Parallels SmartSelect
- Share files and folders between Windows and Mac OS X

**Premium Edition (PAR0005) \$154**

**Premium Edition Academic (PAR0006) \$99**

parallels



**\$97**

**SAVE \$17 off RRP**  
WebCode: PAR0003

Perfect for business

## Microsoft Office 2008 for Mac

Microsoft Office 2008 for Mac is more powerful and easier to use, helping you to achieve more and simplify your day. New features, intuitive new look, Universal support, and compatibility with Office for Windows will unleash your productivity.

- Word 2008
- Excel 2008
- Powerpoint 2008
- Entourage 2008
- Exchange Support

**Upgrade (MSA3774) \$292**



**\$494**

**SAVE \$155 off RRP**  
WebCode: MSA3773

Entry level multimedia suite

## Apple iLife 08

iLife '08, a major update to Apple's award-winning suite of digital lifestyle applications, delivers significant upgrades to iPhoto, iWeb, iMovie, iDVD, plus a completely reinvented iMovie that offers a revolutionary new way to enjoy, edit and share your video.



**5 User**  
(APPO324) **\$126**

Apple Authorised Reseller

**\$92**

**SAVE \$7 off RRP**  
WebCode: APP0323

Office apps & creative suite

## Microsoft Office 2008 for Mac Special Media Edition

Office 2008 for Mac Special Media Edition is more powerful and easier to use, helping the media-savvy Mac user achieve more while simplifying the management of digital assets. Intuitive new look and compatibility with Office for Windows will unleash your productivity and creativity.

**Upgrade (MSA3772) \$387**



**\$592**

**SAVE \$257 off RRP**  
WebCode: MSA3771

Databases made easy

## FileMaker Bento

Meet Bento, the new personal database from FileMaker that's as easy to use as your Mac. It organises all the details of your busy life in one place. So you can manage contacts, coordinate events, track projects, and prioritize tasks faster and easier than ever before. It's never been easier to get organized thanks to built-in links with Mac OS X.

**5 User (FIL2016) \$129**

FileMaker



**\$79**

WebCode: FIL2015

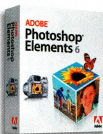


### Top selling home photo editor

## Adobe Photoshop Elements 6

Adobe Photoshop Elements 6 software for Macintosh combines power and simplicity so you can go beyond the basics. Make your photos look their best, share them in creative ways, and easily find and view them. Photoshop Elements also works great with iPhoto.

Academic (AEP9552) \$76



**\$128**

SAVE \$21 off RRP  
WebCode: ALD9636

### Professional video editing

## Apple Final Cut Studio 2

Final Cut Studio 2 helps take you beyond mere editing. Discover the intuitive power of new creative tools designed expressly for Final Cut Pro editors. Rapidly move through editing to motion graphics, audio editing and mixing, color grading, and delivery - all as a natural extension of the work you already do.

Upgrade  
APP0289) \$605



Authorised Reseller

**\$1595**

SAVE \$103 off RRP  
WebCode: APP0288

### Leader in CAD software

## Punch! ViaCAD

In ViaCAD, 3D designs automatically create 2D details, plans and elevations with a single mouse click. It creates section and detail views, Bill of Materials lists, and includes complete 3D editing tools, annotation, and dimensions, among many other practical features.

The software also delivers industry standard interoperability including Google SketchUp, AutoCAD 2007, Adobe Illustrator and other common 3D formats.



**\$138**

SAVE \$11 off RRP  
WebCode: PUN0027

### Professional RAW photo editor

## Apple Aperture 2

Aperture 2 gives photographers incredible tools to manage massive libraries, speed through photo edits, make essential image adjustments, and deliver photos online and in print using one simple, integrated workflow. Whether you shoot RAW or JPEG, Aperture lets you get the most out of your photography.



Authorised Reseller

**\$259**

WebCode: APP0372

### Leading Mac burning suite

## Roxio Toast 9 Titanium

Compress, convert and compile videos as well as capture audio from any source. Burn discs on the Mac with a host of improved features such as:

- Import and create HD projects
- Burn HD TiVo TV shows and movies
- Stream your recorded home movies and more to your internet connected Mac or PC



roxio

**\$161**

SAVE \$18 off RRP  
WebCode: ROX5009

### #1 AntiVirus Software for Mac

## Norton AntiVirus 11.0

It removes viruses automatically, cleans infected Internet and email downloads, and protects against advanced online threats and attacks that target newly discovered operating system and application vulnerabilities.

Use the enhanced, all new dashboard widget to quickly check your system's virus protection status. Compatible with new Mac OS X v10.5.



symantec.

**\$52**

SAVE \$7 off RRP  
WebCode: SYM9799

### Top selling Mac software

#### Accounting

MYOB AccountEdge v7	MYB0080 <b>\$523</b>
MYOB FirstEdge	MYB0005 <b>\$132</b>
MYOB Test Drive v17	MYB0081 <b>\$10</b>

#### Database Tools

FileMaker Pro 9	FIL2000 <b>\$477</b>
FileMaker Pro 9 5-User	FIL2003 <b>\$1914</b>
FileMaker Pro 9 5-User Upg	FIL2004 <b>\$1134</b>
FileMaker Pro 9 Academic	FIL2002 <b>\$294</b>
FileMaker Pro 9 AE 5-pack	FIL2005 <b>\$1182</b>
FileMaker Pro 9 Adv AE	FIL2008 <b>\$479</b>
FileMaker Pro 9 Advanced	FIL2006 <b>\$756</b>
FileMaker Pro 9 Adv Upg	FIL2007 <b>\$473</b>
FileMaker Pro 9 Upgrade	FIL2001 <b>\$288</b>
FileMaker Server 9 Upgrade	FIL2010 <b>\$939</b>

#### Design Tools

Corel Painter X	COR8700 <b>\$598</b>
Corel Painter X Academic	COR8702 <b>\$132</b>
Corel Painter X Upgrade	COR8701 <b>\$335</b>
Extensis Suitecase Fusion 12	EXT0084 <b>\$169</b>
Enfocus PitStop Pro 7.2	ENF0003 <b>\$1155</b>
Punch! Home Design Studio	PUN0020 <b>\$170</b>
QuarkXPress 7	QUA0040 <b>\$1375</b>
QuarkXPress 7 Academic	QUA0045 <b>\$235</b>
QuarkXPress 7 Upgrade	QUA0042 <b>\$472</b>

#### Education

Britannica 2008 Ref Suite	MND1181 <b>\$89</b>
Mavis Beacon Typing 17	BRD0030 <b>\$50</b>

#### Graphic Suites - Student Editions

Adobe CS3 Design Premium	ADS0006 <b>\$419</b>
Adobe CS3 Design Standard	ADS0008 <b>\$280</b>
Adobe CS3 Master Collection	ADS0010 <b>\$697</b>
Adobe CS3 Production Premium	ADS0012 <b>\$422</b>
Adobe CS3 Web Standard	ADS0014 <b>\$282</b>

#### Multimedia

i-Studio for iPod	MAN0104 <b>\$28</b>
NewTek LightWave 3D v9.3	NEW0020 <b>\$2999</b>
Roxio Crichton	ROX5001 <b>\$88</b>
Roxio Popcorn 3 for Mac	ROX5003 <b>\$88</b>

#### Photo Editing (Adobe)

Photoshop CS3 Ext Student	ADS0016 <b>\$216</b>
Photoshop Elements 4 EDU	AEP9516 <b>\$76</b>
Photoshop Lightroom 1.1	ALD0053 <b>\$400</b>
Photoshop Lightroom 1.1 EDU	AEP0028 <b>\$138</b>

#### Productivity (Adobe)

Acrobat 8 Professional EDU	AEP9522 <b>\$191</b>
Acrobat 8 Professional	ALD9591 <b>\$599</b>
Acrobat 8 Pro Upgrade (Pro)	ALG9529 <b>\$213</b>
Acrobat 8 Pro Upgrade (Std)	ALG9518 <b>\$213</b>

#### System Tools

Alsoft DiskWarrior 4.00	ALS0003 <b>\$143</b>
Alsoft DiskWarrior 4.00 Upg	ALS0009 <b>\$88</b>

#### Web/Internet

Adobe Dreamweaver CS3	ALD0082 <b>\$575</b>
Adobe Fireworks CS3	ALD0084 <b>\$432</b>
Microsoft Expression Studio	MSS0082 <b>\$934</b>
Mr Sites - Internet In a Box	MRS0001 <b>\$99</b>





## City Software & CSW-IT The Software Licensing Experts

Organisations are always looking at ways of cutting costs but rarely do they find a solution that rewards them for doing so. Not only will you save money, but you will save time and reduce the risk of over-purchasing, a common trap particularly for small/medium businesses. Widely recognised as market leaders in software licensing, City Software's goal is to discover your needs and create a plan to solve your needs. This will involve lowering the total cost of ownership and eliminate worries such as non-compliance. City Software will become your IT watchdog by tracking your agreements over time and forecasting your needs, therefore keeping you on the right track for a stable IT infrastructure. City Software & CSW-IT have a broad knowledge of software licensing options and will be happy to assist with any of the products marked in this catalogue with the "Licensing Available" tag.

CITY SOFTWARE CSW-IT

1300 658 600 - licensing@citysoftware.com.au



### Nuance & Adobe Volume Licensing



The Nuance Volume License Program (VLP) is a program that enables customers to license software for use, rather than purchase "boxed" products per user. This reduces product costs by eliminating unnecessary media, documentation, packaging, warehousing, and shipping. The savings are passed on to the customer in the form of a discount off the standard price.

#### Benefits for you

- Save money over retail packaged software
- Requires no commitment beyond the first purchase
- Purchasing made easy with no contract necessary
- Order any software on the same agreement during the one year term
- Choose to add Software Assurance to any of your licenses
- Enterprise software provided that eases systems installations and software management



Purchasing under Adobe's licensing programs is your best option when you require multiple copies of Adobe Software.

#### Key Benefits are:

- Lower software costs.
- Reduced ordering and license administration, simplifying total software management efforts and streamlining internal business processes.
- Web-based license management tool.
- With Upgrade Plan option, technology consistency across the user base and deployment of the most current technology.
- Greater ability to manage legal compliance

### Microsoft Windows Server 2008



Windows Server 2008

Microsoft Windows Server 2008, with built-in Web and virtualisation technologies, enables businesses to increase the reliability and flexibility of their server infrastructure. New virtualisation tools, Web resources, and security enhancements help save time, reduce costs, and provide a platform for a dynamic and optimised datacenter. Powerful new tools, like Internet Information Services (IIS) 7.0 and Server Manager, provide more control over servers, and streamline Web, configuration, and management tasks. Advanced security and reliability enhancements, such as Network Access Protection and the Read-Only Domain Controller, harden the operating system and help protect the server environment to ensure a solid foundation on which to build businesses.



**LICENSING AVAILABLE**  
1300 658 600  
licensing@citysoftware.com.au

### Microsoft Volume Licensing

#### Microsoft Volume Licensing for Business (5-250 PCs)

Microsoft Open License is a simple and flexible software volume licensing program designed for customers who order as few as five licenses. Open License benefits include:

- Significant discounts over full retail prices.
- Ability to obtain licenses through multiple locations from a worldwide reseller channel.
- Easier management of license portfolios with eOpen (electronic license management)

#### Microsoft Open Business

Open Business is for companies looking to save money without a large up-front volume commitment. The initial order is five or more licenses for any combination of Microsoft products. You can place reorders for two full years and enjoy discounts. There is no minimum reorder quantity.

#### Microsoft Open Volume

Open Volume is for companies looking to take advantage of volume discounts greater than those offered under Open Business who can place a minimum initial order of 500 points within a product pool. Each license carries a unit value of at least one point; some licenses count for higher unit values. You qualify for the same discount as your initial order when you place additional orders as small as one license throughout the two-year term of your License Agreement.

#### Microsoft Open Value

Microsoft Open Value is a premium volume licensing offer available under the Open License family. Designed for organisations with as few as five computers, Open Value offers simpler license tracking, greater control over the software upgrade cycle, and better software cost management. Open Value also offers the advantages of Software Assurance (SA), which includes new version upgrades, technical training, user training, partner services, and product support. These benefits are available through the term of the agreement to improve software resource planning, ROI measurement, and IT professional and user productivity.

Small and Medium Business choose **City Software** because

## WE UNDERSTAND

*Your Business*

### SAP Business One and Business Management Software Solution Experts

#### Our Business

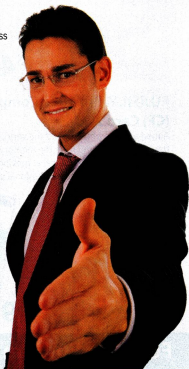
City Software Business Solutions, part of the City Software Group is one of Australia's leading providers of SAP Business One and Business Management Solutions. Our primary focus is to provide your business with commercially proven, easy-to-use, reliable and affordable Business Management Systems and Solutions that have been designed with the sole purpose of enhancing your business.

#### Our solutions are designed to suit a range of industries:

- Wholesalers
- Distributors
- Importers
- Retailers
- Light Manufacturers
- Construction
- Engineering Services
- Professional Services

#### What solutions does City Software Business Solutions have to offer?

- Business Process Flow Analysis
- Business Management Software
  - Accounting
  - Sales
  - Purchasing
  - Stock Control
- Workflow Automation
- Business Intelligence (BI)
- Warehouse Management
- Project Management
- Job Costing
- Payroll
- POS Retail Management
- e-Commerce Web Tools
- MS Office Integration
- Flexible Reporting Tools



### Would you like more information?

Please contact us today on 1300 762 762 or email us at [info@csbs.com.au](mailto:info@csbs.com.au) or visit our website [www.csbs.com.au](http://www.csbs.com.au)



SAP has designed SAP Business One, a business management software application, specifically for small and midsize businesses. It's an affordable, easy-to-use way to manage critical business functions across sales, distribution, and financials – all in a single integrated software system. With SAP Business One, you can instantaneously access critical data that provides a complete and up-to-the-minute view of your business – so you can respond to customers faster and grow your business more profitably.



**Workbench** is a comprehensive Job Costing system combined with a range of "Operational Management" modules, integrated into a number of different financial systems to provide a total business solution for any organisation involved in Jobbing. The software is designed to provide 'operational' staff with an appropriate management solution while continuing to meet the accounting needs of the organisation through the integration with a variety of external financial accounting systems, including SAP Business One.



**BI Plus** is the breakthrough consolidated BI & Reporting Tool that does it all. BI Plus' philosophy is that dashboards need not be the exclusive domain of executives but are available to anyone with a need for reporting and importantly they are simple to configure. Corporate performance management showing snapshots of strategic operational, financial and corporate data via dashboards are made simple. Dashboards in BI Plus are created more easily than with any competing product.

## FUJIFILM Pro 60x Secure Digital (SD) Card 2GB

Intended for demanding professional applications, the 60x Secure Digital card is suitable for all high end digital work. Backed up by the Fujifilm reputation for excellence in image capture, this is a reliable, versatile memory card.



1GB (FJ10073) \$28

**\$45** SAVE \$9 off RRP  
WebCode: FJ10074

## FUJIFILM Pro 100x Compact Flash (CF) Card 2GB

Aimed at users who demand the very best in terms of transfer speed to and from the memory card, this 100x Compact Flash card will excel at moving data quickly. For the most demanding professional photographic and digital applications.



4GB (FJ10072) \$138

**\$92** SAVE \$13 off RRP  
WebCode: FJ10071

## FUJIFILM FinePix Z10fd

Express yourself in colour and say it in photos. The Fujifilm Finepix Z10fd is a super slim, fun and stylish 7.2 megapixel 3x optical zoom digital camera housing many features including Face Detection with automatic red-eye correction, PS (Picture Stabilisation) mode and Intelligent Flash.



Black Version (FJ10067) \$220



**NEW**

**\$229** SAVE \$20 off RRP  
WebCode: FJ10066

## FUJIFILM 4GB USB Drive

The Fujifilm USB Drive is perfect to easily manage and transfer digital files. Available in capacities from 1GB to 4GB. The drive's soft rubber exterior is designed to withstand day to day wear and tear whilst protecting your most precious data, lightweight design allows it to easily slip into your pocket, onto a keychain, or even your mobile phone.

- Capacity - Up to 4GB
- Connector/Port - USB 2.0
- Description - Portable USB 2.0 Drive
- Operating System Compatibility - Windows 98/2000/Me/XP, Mac OS 9.0+, Linux 2.4
- Reading Speed - 4MB per second

1GB (FJ10068) \$23

2GB (FJ10069) \$38



**\$68** SAVE \$6 off RRP  
WebCode: FJ10070

For your Fujifilm data media requirements call **CSW-IT** 1300 761 761

### LTO Ultrium 1 100/200GB

- Low error rates
- Lower head wear
- Enhanced reliability



WebCode: FJ10027

### LTO Ultrium 2 200/400GB

- Superior durability
- Lower head wear
- High transfer speed



WebCode: FJ10028

### LTO Ultrium 3 400/800GB

- Large storage capacity
- Enhanced reliability
- Fujifilm servo technology



WebCode: FJ10029

### LTO Ultrium 4 800GB/1.6TB

- Increased cartridge capacity
- NANOCUBIC thin-film coating process.



WebCode: FJ10062

### DAT72 170m 36/72GB

- Powered by Fujifilm's exclusive ATOMM technology. Reliable backup and long term archiving using 45 structure



WebCode: FJ10042

DDS has become the world standard for storing and backing up computer data on tape and now you can enjoy even higher capacity, higher output, and higher reliability than ever before. Remarkably low error rates, high output and MRS (Media Recognition System for assured reliable performance) are all characteristics of the Fujifilm DG Series.

### DDS DG-90m 1.3/2.6GB



WebCode: FJ10037

### DDS DG-120m 4/8GB



WebCode: FJ10038

### DDS3 DG-125m 12/24GB



WebCode: FJ10039

### DDS4 DG-150m 20/40GB



WebCode: FJ10040





## WD Passport Essentials

With a beautiful gloss case that fits smoothly in your hand and pocket, the elegant little My Passport Essential Portable USB Hard Drive from Western Digital has mega-capacity for all your digital content. The world's most sought-after portable drive just became the most stylish way to carry thousands of songs or pictures. Because the drive is powered directly through the USB cable, there is no power adapter to carry.



**BONUS**  
carry case  
**\$25**  
value

**PC USER**  
**BEST**  
**BUY**

### RED

160GB (WDD0152) \$139  
250GB (WDD0153) \$189  
320GB (WDD0154) \$269

### BLUE

160GB (WDD0149) \$139  
250GB (WDD0150) \$189  
320GB (WDD0151) \$269

### BLACK

160GB (WDD0146) \$139  
250GB (WDD0147) \$189  
320GB (WDD0148) \$269

## WD My Book Essentials

They're your photos ... your music ... your videos ... your important files. Make extra room for them and keep them safe on My Book Essential Edition USB 2.0 external hard drive from WD. Easy to set up, easy to use -- this drive is all about simplicity. Plug it into your computer's USB 2.0 port and start saving. It's so simple and integrated that the drive even turns on and off with your computer. With just the essential features for add-on storage it's perfect for all your precious digital assets.



320GB (WDD0119) \$129  
500GB (WDD0120) \$169  
750GB (WDD0121) \$239  
1TB (WDD0122) \$329

## WD My Book Home

Your baby's first step, your wedding in Bali, all your important milestones... all captured in digital photos and video. What could be more important? Store them safely and keep them backed up on a My Book Home Edition triple interface external hard drive. With this elegant, collectable product that takes no more space than a paperback book, you can save a copy of your photos to an online sharing service, duplicate your e-mail and contacts to your iPod, and back up all your precious files to your My Book.



320GB (WDD0127) \$168  
500GB (WDD0128) \$186  
750GB (WDD0129) \$338  
1TB (WDD0130) \$387

## WD My Book World

Home Network Hard Drive with Remote Access  
Designed for home users, creative professionals, workgroups, and anyone looking for network storage, WD's My Book World Edition offers a surprisingly simple way to centralize data, photos, and music at home and in the office, backup up multiple PCs to one location and access your data from anywhere in the world even when your local computer is turned off. Wherever you are, My Book World Edition is accessible, just like a local drive, using Windows Explorer.



500GB (WDD0086) \$239  
750GB (WDD0134) \$339  
1TB (WDD0135) \$389

Mission-critical networking at

**400,730** metres up

Friday Feb 7th 2008 - Space Shuttle Atlantis mission STS-122 takes ProCurve to the International Space Station

### ProCurve Access Point and Switch Bundle

The ProCurve Wireless Access Point and Switch Bundle is ideal for small enterprise networks that need quick deployment with minimal investment. Covered by the leading ProCurve Lifetime Warranty, The Wireless Access Point can be configured in minutes using intuitive Web Managed interface and is flexible and interoperable.

#### ProCurve Access Point Specification

- Supports Wi-Fi Protected Areas WPA or WPA2
- Supports 802.11a and 802.11b/g wireless standards
- Supports up to 8 SSIDs

#### ProCurve 1700-8 Switch Specifications

- 7 auto-sensing 10/100 ports
- 1 auto-sensing 10/100/1000 port
- Media Type: ProCurve Auto-MDIX
- Duplex: half or full



ProCurve Access Point and Switch Bundle

Our Price **\$347.00**

Save **\$54.00**

WebCode

HP E5500

### ProCurve 2610 Switch Series

For small and mid-sized businesses the new ProCurve Switch 2610 Series offers security and world-class reliability. It's backed by the ProCurve Lifetime Warranty and is ideal for connecting multiple devices such as VoIP (voice over IP), wireless LANs and security cameras.

The Series consists of five switches—the 2610-24 and 2610-48 provide 24 and 48 ports of 10/100 connectivity. The 2610-24/12PWR, 2610-24-PWR, and 2610-48-PWR are IEEE 802.3af-compliant for Power over Ethernet (PoE). All switches include two 10/100/1000Base-T ports and two mini-GBIC slots for Gigabit uplink connectivity. With static routing, robust security and management features, free lifetime warranty, and freeware updates, the 2610 series is a cost-effective solution for builders of converged enterprise edge networks.



ProCurve 2610-24/12PWR Switch

Our Price **\$1067.00**

Save **\$95.00**

WebCode

HP E9086



For as long as you own the product, with next-business-day advance replacement (available in most countries). The following hardware products and their related family modules have a one-year warranty with extensions available: The ProCurve Routing Switch 9300m Series, ProCurve Switch 800 Series, ProCurve Access Control Server 7400 and the ProCurve Network Access Controller 800. Stand-alone software may have a different warranty duration. For details refer to the ProCurve Software License, Warranty and Support booklet at: <http://www.hp.com/eml/support/warranty/index.htm>  
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## 14x faster than wireless-G

D-Link RangeBooster N USB  
Adapter DWA-140**\$116** SAVE \$24 off RRP  
WebCode: DLK0090D-Link RangeBooster N 650  
Desktop Adapter DWA-647**\$116** SAVE \$24 off RRP  
WebCode: DLK0091D-Link Xtreme N PCI Express  
Desktop Adapter DWA-556**\$137** SAVE \$23 off RRP  
WebCode: DLK0091D-Link Xtreme N Notebook  
ExpressCard DWA-643**\$137** SAVE \$23 off RRP  
WebCode: DLK0092D-Link Xtreme N Gigabit Router  
DIR-655

The D-Link Xtreme N Gigabit Router is a draft 802.11n compliant device that delivers up to 300Mbps and superior wireless coverage for larger environments & bandwidth-intensive applications. Backwards compatible with 802.11b/g, connected to a Cable/DSL modem provides high-speed internet access to PC's, gaming consoles and media players.



D-Link

**\$259**SAVE \$40 off RRP  
WebCode: DLK0064

## Plug 'n' play networking

D-Link Powerline HD Network  
Starter Kit DHP-301

Create a smooth and secure network with simple plug 'n' play Powerline technology and stream data into hard to reach areas of the home. Avoid unnecessary Ethernet cables or expand a Wi-Fi network with speeds up to 200Mbps over existing electrical wires. Ideal for HD Video, music sharing and on-line gaming.

DHP-300 - Powerline  
HD Ethernet Adapter  
(DLK0096) **\$151**

D-Link

**\$285**SAVE \$44 off RRP  
WebCode: DLK0098

## Basic wireless networking

## D-Link Wireless G Router DIR-300

Create a wireless network for your home and share it securely with Tomzone using the D-Link Wireless G Router. Connect the Wireless G Router to a broadband modem and wirelessly share your high-speed Internet connection and enjoy surfing the web, checking e-mail, and chatting with family and friends online.

Wireless USB Adapter  
(DLK3003) **\$40**

NEW



D-Link

**\$79**SAVE \$20 off RRP  
WebCode: DLK3006

## Ultimate security solution

## D-Link Firewall DFL-800

The new D-Link DFL-800 Network Security Desktop VPN Firewall appliance is an easy-to-deploy VPN and firewall solution designed for SMB's that demand superior performance and security, providing integrated Network Address Translation (NAT), SPI Firewall, advanced content filtering features, IDS protection, bandwidth management, and VPN support.



D-Link

**\$1045**SAVE \$154 off RRP  
WebCode: DLK6059

## All-in-one ADSL2+ wireless router

D-Link RangeBooster N ADSL2+  
Modem Router DSL-2740B

The DSL-2740B RangeBooster N ADSL/ADSL2+ Modem Router is a versatile, high-performance remote router for the home and small office. With integrated ADSL2+ supporting up to 24Mbps download speeds, firewall protection, Quality of Service (QoS), 802.11n wireless LAN (draft 1.0) and 4 Ethernet switch ports, this router provides all the functions that a home or small office needs to establish a secure and high-speed link to the Internet.



D-Link

**\$262**SAVE \$37 off RRP  
WebCode: DLK0065

## Designed for the small office

D-Link Wireless ADSL2+/  
VPN Router DSL-G804V

This router is a versatile, high-speed remote router designed for the small office. With integrated ADSL2+ supporting up to 24Mbps download speed, IPsec VPN data encryption, firewall protection, Quality of Service (QoS), 802.11g wireless LAN and 4 Ethernet switch ports, this router provides all the functions that a small business needs to establish a reliable and convenient high-speed remote link to the outside world.



D-Link

**\$263**SAVE \$36 off RRP  
WebCode: DLK9210

## Wirelessly share internet

D-Link RangeBooster N 650  
Access Point DAP-1353

Providing connectivity for wireless computer users and wireless print servers on the 2.4GHz band, this Access Point provides a fast 802.11n wireless performance while remaining fully compatible with 802.11b/g devices. Connect to an Internet-enabled wired network and wirelessly share high-speed Internet.

Perfect for use in bigger homes or offices and for users that demand higher networking performance.



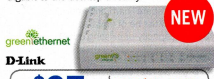
D-Link

**\$277**SAVE \$52 off RRP  
WebCode: DLK3007

## Reduce carbon emissions today

D-Link Green Ethernet  
Unmanaged 5-Port Gigabit  
Switch DGS-1005D

The D-Link GigaExpress DGS-1005D is an energy efficient 5-port 10/100/1000Mbps Gigabit Switch that delivers power, performance, and reliability in one cost-effective, space-saving design. Increase the speed of your network server and backbone connections, or make Gigabit to the desktop a reality.



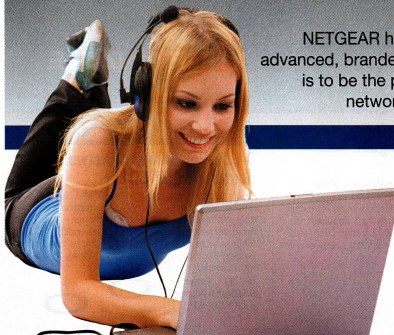
D-Link

**\$67**SAVE \$12 off RRP  
WebCode: DLK0666



NETGEAR has been a worldwide provider of technologically advanced, branded networking products since 1996. Our mission is to be the preferred customer-driven provider of innovative networking solutions for small businesses and homes.

1300 658 600 [www.citysoftware.com.au](http://www.citysoftware.com.au)



### NETGEAR Digital Entertainer EVA8000

Access and enjoy your digital entertainment easily on your TV and HDTV. Streams movies, videos, music, Internet radio, and photos from your home PCs and storage devices to your HDTV.



**\$472** SAVE \$127 off RRP  
WebCode: NTG7992

### NETGEAR RangeMax Wireless Modem Router DG834PN

Wirelessly stream music, make Internet phone calls and surf the web faster and further.

- ADSL2/2+ modem built in
- Share your Broadband Internet connection simply and securely
- Easy set-up with Smart Wizard installation CD

**\$204** SAVE \$25 off RRP  
WebCode: NTG7582

### NETGEAR RangeMax Dual Band Wireless N Router WNDR3300

Surf, email, stream HD video, on-line game, make Internet phone calls—simultaneously

- More wireless channels, less interference and better connections using dual band
- Wireless-N Wirelessly connect new devices easily and securely with Push 'N' Connect.



NEW

**\$213** SAVE \$86 off RRP  
WebCode: NTG8115

### NETGEAR RangeMax Dual Band Wireless N USB 2.0 Adapter WDNA3100

Wirelessly surf, email, stream HD video, on-line game, make Internet phone calls

- Less interference and better connections using dual band Wireless-N
- Better speed and range than other USB Wireless-N adapters



NEW

**\$115** SAVE \$13 off RRP  
WebCode: NTG8116

### NETGEAR HD/Gaming 5GHz Wireless N Networking Kit WNHDEB111

For high-performance wireless network gaming and multiple HD video streaming

- More wireless channels, less interference and better connections using 5 GHz Wireless-N band
- Automatic Quality of Service (QoS) ensures lag-free gaming and jitter-free HD streaming



NEW

**\$311** SAVE \$38 off RRP  
WebCode: NTG8117

### NETGEAR ReadyNAS Duo 500GB RND2150

The ReadyNAS Duo is perfect for homes with more than one computer. Unlike a USB drive, the ReadyNAS connects to the network and is simultaneously accessible via all connected Windows or Macintosh computers.

- Directly streams music, photos and video to existing network media players without a computer
- Creates a personal webpage to easily share photos with friends and family
- Insert optional "spare" hard drive for automatic file protection and back-up

(Optional "spare" hard drive not included. Must be of equal or greater capacity of existing drive)

750GB (NTG8134) \$727  
1TB (NTG8135) \$968

**\$582** SAVE \$117 off RRP  
WebCode: NTG8133

### NETGEAR ProSafe 24 Port Gigabit Switch GS724T

Joining NETGEAR's family of Smart Switches with simple switch management at no extra cost, these 16- and 24-port Gigabit switches are high on value and capability.

- 24 10/100/1000 Mbps gigabit ports
- Non-blocking bandwidth
- Easy, browser-based switch management

48 Port (NTG7294) \$1199

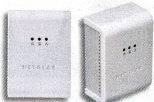


**\$608** SAVE \$221 off RRP  
WebCode: NTG7158

### NETGEAR Powerline HD Network Kit HDBX101

Turn Any Electrical Outlet into an HD-Streaming Ethernet Connection

- Enables high-quality video streaming, gaming and VoIP over a home network
- Delivers up to 200 Mbps to any outlet



**\$325** SAVE \$44 off RRP  
WebCode: NTG7975

## Linksys Wireless-N PCI Adapter (WMP300N)

\$94 **SAVE \$55 off RRP**  
WebCode: LNK5545

## Linksys Wireless-N Notebook Adapter (WPC300N)

\$94 **SAVE \$55 off RRP**  
WebCode: LNK5546

## Linksys Wireless-N USB Adapter (WUSB300N)

\$94 **SAVE \$55 off RRP**  
WebCode: LNK1295

## Linksys Ultra RangePlus Wireless-N Router WRT160N

- Internet-sharing Router and 4-port Switch, with a built in speed and range enhanced Wireless Access Point
- MIMO technology uses multiple radios to create a robust signal that travels farther and reduces dead spots
- Much faster than Wireless-G, but also works great with Wireless-G and-B devices

NEW

\$144 **SAVE \$25 off RRP**  
WebCode: LNK6284

## Entry level wireless networking

## Linksys Wireless-G Broadband Router WRT54G

With the Linksys Wireless-G Broadband Router at the centre of your home or office network, you can share a high-speed Internet connection, files, printers, and multi-player games with the flexibility, speed, and security you need

\$73 **SAVE \$36 off RRP**  
WebCode: LNK0009

## All-in-one internet solution

## Linksys Wireless-N ADSL2+ Gateway WAG160N

- High-speed ADSL2+ Modem gives you a fast, "Always On" connection to the Internet
- Connect your PCs via the built-in Router and 4-port Switch to jump start your Ethernet network and share the Internet throughout the building
- Built-in Wireless-N (draft 802.11n) Access Point also lets you connect without running wires

NEW

\$172 **SAVE \$37 off RRP**  
WebCode: LNK6285

## All lengths available

## Belkin Snagless Ethernet Patch Cables - Blue

The RJ45 Moulded Cat 5e Patch Cable is perfect for use with 10/100 Base-T networks. Complete with RJ45 male-to-male connectors and Snagless moulded strain relief.

1m (BEL8009) \$6  
2m (BEL8016) \$10  
3m (BEL8023) \$12  
5m (BEL8030) \$16  
10m (BEL8037) \$22  
15m (BEL8044) \$32

Also available in Green, Red, White, Yellow & Black

HOT  
Prices

BELKIN

## View your networks performance

## Belkin N1 Vision Broadband Router

The N1 Vision wireless router offers an easy way for you to view your network's broadband speed, computer bandwidth usage, and the status of your connected devices - all from an easy-to-read display. N1 Vision offers the best in networking performance with its wireless 802.11n 3x3 radio design and wired gigabit ports.

\$297

**SAVE \$52 off RRP**  
WebCode: BEL9515

## Wireless-G home solution

## NetComm Telstra approved ADSL splitter/filter

- Recommended for ADSL2+

\$18 **SAVE \$7 off RRP**  
WebCode: NET4881

## NetComm NB50 ADSL2+ Wireless Modem Router

- Wireless 54G ADSL2+ Modem Router
- Built-in Firewall for security & peace of mind

\$108 **SAVE \$60 off RRP**  
WebCode: NET9511

## NetComm NP285 Turbo HomePlug Twin Pack

- 85Mbps Ethernet over Power adapters

\$187 **SAVE \$12 off RRP**  
WebCode: NET9510

## NetComm 54G Wireless Firewall Router

The NetComm NB504 54Mbps Wireless Router integrates a firewall, NAT-router, Wireless AP and is designed to be a dedicated Small Office/Home Office (SOHO) Wireless network solution. Combined with the NP545 Wireless USB Adapter you will be able to connect your network wirelessly better than ever.

BONUS  
Wireless  
USB Adapter  
\$49 Value\$118 **SAVE \$10 off RRP**  
WebCode: NET9528

**SAMSUNG**

Imagine a range of printers inspired by you

**SAMSUNG CLP-300 Colour Laser Printer**

The SAMSUNG CLP-300 colour laser printer is small and light, with the big colour you're looking for. Built with SAMSUNG's exclusive NO-NOIS print engine, its toner cartridges are fixed securely in place, so it prints with just a whisper. Toner changes couldn't be easier. In fact, it received the red dot design award for its unique toner design.

- Print Speed: Up to 16ppm mono & 4ppm colour
- Print Resolution: Up to 2400x 600dpi
- First Page Out Time Mono: 14 Seconds
- First Page Out Time Colour: 26 Seconds
- Duty Cycle: up to 24,200 pages per month
- Paper Tray: 150 sheet cassette
- Connectivity: USB 2.0
- OS Supported: Win 98/ME/2000/XP/Vista, Linux & Mac OSX 10.3 ~ 10.4

**Network Version CLP-300N (SAM2020) \$208\*****\*After \$100 cashback (ends 30/04/2008)**

\* See citysoftware.com.au/promotions for terms and condition

**You Pay \$240****\$140\*****SAVE \$209 off RRP**

WebCode: SAM3001

**SAMSUNG CLX-3160FN Network Colour Multifunction**

Prints, copies, scans and faxes, and does it all in colour and offers the choice of brilliant colour. It fits your needs and your space.

- Print Speed: Up to 16ppm mono & 4ppm colour
- Print Resolution: 2400 x 600 dpi
- Copy Speed: First copy out time 18 seconds
- Scan Resolution: Up to 4800 dpi
- Connectivity: USB & Ethernet
- Duty Cycle: up to 24,200 pages per month
- Paper Tray: 150 sheet multi purpose

**3 Years Warranty****\$711****SAVE \$88 off RRP**

WebCode: SAM3160

**SAMSUNG CLP-660ND Network Colour Laser Printer**

Imagine high performance coupled with maximum efficiency.

- Print Speed: Up to 24ppm mono & 24ppm colour
- Print Resolution: Up to 2400x 600dpi
- First Page Out Time: 14 Seconds
- Duty Cycle: up to 80,000 pages per month
- Paper Tray: 250 sheet cassette
- Connectivity: USB 2.0 & Ethernet
- OS Supported: Win 2000/XP/Vista/2003 Server, Various Linux versions

**3 Years Warranty****\$963****SAVE \$36 off RRP**

WebCode: SAM0661

**SAMSUNG SCX-4521F A4 Mono Multifunction**

Bigger and faster is good. But smaller and faster is better. The compact SCX-4521F is an economical and efficient four-in-one solution for home-based and small office settings. Print sharp text and graphics at speeds up to 20ppm.

- Print Speed: Up to 20ppm
- Print Resolution: 600 x 600 dpi
- Copy Speed: First copy out time 11 seconds
- Scan Resolution: Up to 4800 dpi
- Connectivity: USB & Parallel
- Duty Cycle: up to 4,200 pages per month
- Paper Tray: 150 sheet multi purpose

**\$267****SAVE \$82 off RRP**

WebCode: SAM4521

**SAMSUNG ML-3471ND Mono Laser Printer**

Imagine a network-ready workgroup laser printer designed to perform as fast and efficiently as you. With a powerful 400MHz processor with 64MB memory, this Professional Series Printer is able to deliver a first-page-out in less than 9 seconds and continue to print at up to 35ppm.

- Print Speed: Up to 33ppm mono
- Print Resolution: Up to 1200x 1200dpi
- First Page Out Time Mono: Less than 8.5 Seconds
- Duty Cycle: up to 50,000 pages per month
- Paper Tray: 250 sheet cassette
- Connectivity: USB 2.0, Parallel & Ethernet

**\$526****SAVE \$73 off RRP**

WebCode: SAM3471



# Mono Laser Printers

1300 658 600 citysoftware.com.au pick up points

**CITY SOFTWARE**  
Black Tie Service, Plain Wrap Prices

Ideal mono printer for small businesses

## HP LaserJet P1505 A4 Mono Laser Printer

Produce professional documents with the HP LaserJet P1505 Printer series with HP spherical toner and an intelligent cartridge that enables high-end features on your desktop. Durable, fast, value-packed - to help you create effective business communications.

- Print Speed: Up to 23ppm mono
- Print Resolution: Up to 600x 600dpi
- First Page Out Time Mono: 6.4 Seconds
- Duty Cycle: up to 8,000 pages per month
- Paper Tray: 260 sheet cassette
- OS Supported: Win 2000/XP/Vista
- Connectivity: USB 2.0

**PC**  
MAGAZINE  
EDITORS  
CHOICE

January 7, 2008  
HP LaserJet P1505



**\$285**

SAVE \$44 off RRP  
WebCode: HPL0412

Great value at 40% off RRP

## Konica Minolta Pagepro 4650EN A4 Mono Laser Printer

- Print Resolution: Up to 1200 x 1200dpi
- First Page Out Time: 10.5 Seconds
- Print Speed: Up to 34ppm
- Duty Cycle: up to 150,000 pages per month
- Paper Tray: 550 sheet cassette
- Connectivity: USB 2.0, Ethernet, Parallel & PictBridge



**\$996**

SAVE \$402 off RRP  
WebCode: QMS4655

Economic & reliable business printer

## Fuji Xerox Docuprint 340A A4 Mono Laser Printer

Even though it is compact in size it is packed with features that will give you big performance while saving you money

- Print Speed: 34ppm
- Res: 1200x1200 dpi
- Connectivity: 10/100 Ethernet, RS232C, IEEE1284, USB
- Duty Cycle: Up to 150,000 per month
- Memory: 64MB std 320MB max



**\$1255**

SAVE \$169 off RRP  
WebCode: FXP0346

## Inkjet Paper

Description	WebCode	Price
<b>Canon Papers</b>		
Canon 4x6 Glossy Photo Plus Cards (20 Sheets)	CAN0103	\$10
Canon 5x7 Glossy Photo Plus Cards (20 Sheets)	CAN0162	\$16
Canon A3 High Resolution Paper (20 Sheets)	CAN0111	\$110
Canon A3 Glossy Photo Paper	CAN0194	\$26
Canon A3 Pro-Quality Photo Paper (10 Sheets)	CAN0113	\$39
Canon A4 Glossy Photo Paper	CAN0173	\$14
Canon A4 High Resolution Paper (200 Sheets)	CAN0080	\$35
<b>Epson Papers</b>		
Epson 4x6 Premium Glossy Photo Paper	EPAL729	\$16
Epson A3 Premium Semigloss Photo Paper	EPA2007	\$94
Epson A3+ Premium Semigloss Photo Paper	EPA2006	\$119
Epson Double-Sided Matte Paper	APAS063	\$34
Epson 4x6 Ultra Glossy Photo Paper (50 Sheets)	EPAL943	\$22
Epson 5x7 Premium Glossy Photo Paper	EPA5070	\$12
Epson A4 Bright White Ink Jet Paper (500 Sheets)	EPA5030	\$19
<b>Kodak Papers</b>		
Kodak A4 Premium Photo Paper Glossy (20 Sheets)	KOD7729	\$15
Kodak A4 Premium Photo Paper Glossy (50 Sheets)	KOD7737	\$29
Kodak A4 Photo Paper Glossy (100 Sheets)	KOD7208	\$31
Kodak 4x6 Photo Paper Glossy (20 Sheets)	KOD7175	\$7
Kodak 4x6 Photo Paper Glossy (60 Sheets)	KOD6571	\$22



## HP Print Loyalty Program

HP is thanking their loyal customers by giving away thousands of dollars worth of free selected HP products every time you redeem points after purchasing eligible HP Printers.

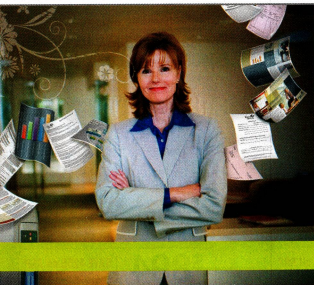
To have your company points redeemed for HP products, you must first nominate a Company Administrator. This allows a senior contact from your company to purchase the selected HP products with the accrued company points tally.

### » Eligible HP Printers

There are over 200 eligible HP Printers and Support Products available for purchasing that can give you up to 125 points per product purchased.

The points value for an eligible HP Printer range from 1 point to 125 points per purchase. With even one HP Printer purchased, your company could be receiving some great free HP products.

Website [www.hp.com.au/printloyalty](http://www.hp.com.au/printloyalty)



Fast Same Day Despatch

Economical Express Delivery

Reliable Knowledgeable Staff



**Smallest A3 colour printer**

**Fuji Xerox DocuPrint C3055DX  
A3 Colour Laser Printer**

- Print Speed: Up to 35ppm mono & 8ppm colour
- Print Resolution: Up to 9600x 600dpi
- First Page Out Time Mono: 11 Seconds, Colour: 22 Seconds
- Duty Cycle: up to 65,000 pages per month
- Paper Tray: 250 sheets
- Connectivity: Ethernet & Parallel



**\*BONUS  
Tray  
Value at  
\$618**

FUJI XEROX

\*See citysoftware.com.au/promotions

**\$1975** **SAVE \$775 off RRP**  
WebCode: FXP3055

**Up to 64 wireless users**

**NETGEAR ProSafe Wireless  
Firewall with 4 Port 10/100  
Switch & USB Print Server**

One powerful device, NETGEAR's ProSafe 802.11g Wireless Firewall with USB Print Server consolidates multiple connection features and gives users the ability to share secure wired & wireless network connections.



NETGEAR

**\$205** **SAVE \$34 off RRP**  
WebCode: NTG7125

**Copying of DVDs & CDs made easy**

**Evocept CopyBlast  
Pro - DVD Duplicator**

The CopyBlast DVD Towers have a highly intuitive, simple to use interface. There is no complex operating system to learn. The LCD display guides the user through all procedures with no training necessary. Copying of DVDs & CDs is more affordable than ever.



**\$513** **SAVE \$36 off RRP**  
WebCode: EVO0001

**Network-ready @ a bargain price**

**Fuji Xerox DocuPrint C1110A  
A4 Colour Laser Printer**

If you've ever wanted a hassle-free colour printer, now's your chance. Execute complex print jobs with ease, and perform routine maintenance in minutes.

- Print Speed: 16ppm mono / 12ppm colour
- Resolution: 9600 x 600 dpi
- Connectivity: 10/100 Ethernet, USB 2.0
- Duty Cycle: up to 40,000 pages per month
- Memory: 128MB std / 512MB max
- Paper Tray: 250 Sheet multi purpose
- True Adobe PostScript 3.0

**C1110B (FXP1110) \$445**

FUJI XEROX

\*See citysoftware.com.au/promotions

**\*BONUS  
\$200  
Cashback**



You Pay \$484  
**\$284**  
After \$200 Cashback\*

**SAVE \$315 off RRP**  
WebCode: FXP1111

**The ultimate in convenience**

**HP Color LaserJet CP1215  
A4 Colour Laser Printer**

The HP CP1215 Printer is HP's most affordable colour laser printer that delivers brilliant results.

- Print Speed: Up to 12ppm mono & 8ppm colour
- Print Resolution: Up to 600x 600dpi
- First Page Out Time Mono: 24 Seconds, Colour: 30 Seconds
- Duty Cycle: 25,000 pages per month
- Connectivity: USB 2.0



hp

**NEW**

**\$326** **SAVE \$22 off RRP**  
WebCode: HPL0376

**Cost effective colour laser printer**

**Fuji Xerox Docuprint C2100  
A4 Colour Laser Printer**

- 25ppm black 17ppm colour
- First page out in 17 second
- Memory Max 128 MB/ 640MB Ram
- Res: 9600x600 dpi
- Up to 60,000 pages maximum monthly duty cycle



FUJI XEROX

**BONUS  
Duplexer  
Value at  
\$248**

**\$686** **SAVE \$139 off RRP**  
WebCode: FXP2100

**Super fast colour printing**

**Konica Minolta Magicolor  
5440DL A4 Colour Laser Printer**

- Print Speed: Up to 25ppm colour & 27ppm mono
- Print Resolution: Up to 2400 x 600dpi
- First Page Out Time: 14 Seconds
- Duty Cycle: up to 60,000 pages per month
- Paper Tray: 500 sheet cassette
- Connectivity: USB 2.0 & Ethernet



KONICA MINOLTA

**\$894** **SAVE \$255 off RRP**  
WebCode: QMS5440

**Integrated card reader & pictbridge**

**HP Color LaserJet CP1518NI  
A4 Colour Laser Printer**

This printer combines sleek and space-saving design with innovative print technologies and features never before available on a personal desktop making it possible to create high-quality business communications in-house.

- Print Speed: Up to 12ppm mono & 8ppm colour
- Print Resolution: Up to 600x 600dpi
- First Page Out Time Mono: 26 Sec., Colour: 32 Sec.
- Duty Cycle: up to 30,000 ppm
- Connectivity: USB 2.0, Ethernet, PictBridge, Card Reader



**NEW**

**\$446** **SAVE \$53 off RRP**  
WebCode: HPL0378



# Laser Multifunction Printers

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**CITY SOFTWARE**  
Black Tie Service, Plain Wrap Prices\*

Colour multifunction designed with business in mind

## Fuji Xerox DocuPrint C2090FS A4 Colour Multifunction

Whether you're printing, copying, scanning or faxing, it gives you the freedom of full-featured performance to work at your very best.

- Print Speed: 25ppm 5ppm colour
- Print Resolution: 600 x 600 dpi
- Copy Speed: 20ppm mono 5ppm colour

**\*BONUS  
\$200  
Cashback**



**FUJI xerox**

You Pay \$1136

**\$936**

After \$200 Cashback\*

**SAVE \$382 off RRP**  
WebCode: FXP2090

Breathtakingly rich, vibrant color

## HP Superior Laser Paper Glossy (Q6616A)

HP Superior Laser Paper Glossy provides the weight band and finish of high-quality marketing collateral. The two-sided coating provides a bright, super-smooth, glossy finish that produces photos and images with professionally printed quality.

- Double sided glossy coating
- 150 A4 sheets
- 160gsm



**hp**

**\$26**

**SAVE \$4 off RRP**  
WebCode: HPD6616

Entry level mono laser multifunction

## Fuji Xerox WorkCentre 3119 A4 Mono Multifunction Printer

- A4 mono laser printer, copier & colour scanner
- 600 x 600dpi printing and copying up to 10,000pages/month
- Scan & edit
- Scan to desktop
- Bundled with Nuance software
- 19 ppm/cpm

**Bonus  
BullGuard  
Internet Sec.  
Value at \$89**



Print, copy, scan, fax

## Fuji Xerox WorkCentre PE220 A4 Mono Multifunction

- Print Speed: 20ppm
- Resolution: 600 x 600 dpi
- Scan resolution: 600 x 600 dpi
- Connectivity: USB 2.0, Parallel
- Duty Cycle: Up to 5,000 pages per month
- Memory: 16MB
- Paper Tray: 150 Sheet multi purpose
- Compatible with Win9x/ME, 2000, XP, Mac OS 10.3-10.5, Linux

**Bonus  
BullGuard  
Internet Sec.  
Value at \$89**



**\$236**

**SAVE \$39 off RRP**  
WebCode: FXP0235

**\$317**

**SAVE \$182 off RRP**  
WebCode: FXP1220

Colour print, copy, scan, fax

## Konica Minolta Magicolor 2490MF A4 Colour MFP

- Print Speed: Up to 5ppm colour & 20ppm mono
- Print Resolution: Up to 2400 x 600dpi
- First Page Out Time: 12 Seconds mono
- Duty Cycle: up to 35,000 pages per month
- Paper Tray: 200 sheet tray
- Connectivity: USB 2.0, Ethernet & PictBridge



**\$882**

**SAVE \$667 off RRP**  
WebCode: QMS2492

Great for small offices

## HP LaserJet M2727nf A4 Mono MFP

The HP LaserJet M2727 is a multifunction device that enables work teams to print, copy, fax and scan over a shared network.

- Print Speed: 26ppm
- Print Resolution: 1200dpi
- Copy Speed: 26cpm
- Scan Resolution: 1200 x 1200 dpi
- Connectivity: 10/100 Ethernet, USB 2.0
- Duty Cycle: Up to 15,000 pages per month
- Paper Tray: 250 Sheet input tray



**\$927**

**SAVE \$171 off RRP**  
WebCode: HPL0532

## D-Link Wireless 108G Multifunction Print Server

- 4 USB 2.0 Printer Connections
- Share Up to 4 USB Printers, Multifunction Printers
- Supports scanning function of multifunction printers
- Easy control & printing of scanned documents
- Integrated 802.11g wireless interface



**D-Link**

**\$191**

**SAVE \$48 off RRP**  
WebCode: DLK9211



Fast Same Day Despatch

Economical Express Delivery

Reliable Knowledgeable Staff

29





## Scan paper, slides & film

### Epson Perfection V700 Photo scanner

- Platen size: A4
- Resolution: Dual Lens Systems- 6400x9600dpi for film, 4800x9600dpi for reflective scanning Monochrome(BI-Level)Draft mode A4 300dpi
- 35mm POSITIVE FILM - 2400dpi 47 sec
- Bundled Software:  
Epson Scan  
Epson Creativity Suite, SilverFast SE6, Adobe Photoshop Elements 3.0
- USB 2.0 / IEEE1394 (FireWire)



**\$837**

SAVE \$112 off RRP  
WebCode: EPS0700

## A snap to use

### Canon LiDE 25 Scanner

Affordable, quality scanning made easy

- 1200 x 2400 dpi optical resolution with 48-bit colour depth for sharp, accurate scans.
- Three one-touch buttons Scan/Copy/E-mail for easy operation.
- Compact and stylish design.
- USB powered.
- Advanced Z-Lite accommodates scanning of bulky items such as books with ease.



Canon

**\$108**

SAVE \$11 off RRP  
WebCode: CAN0403

## World's first 6 colour scanner

### HP Scanjet G4010 Photo Scanner

Enjoy high-definition scan quality that delivers vivid and realistic images with each scan. Keep those memories alive for years to come. Anyone can easily preserve and restore their cherished photos, negatives and slides with the HP Scanjet G4010 Photo Scanner.



NEW

**\$356**

SAVE \$13 off RRP  
WebCode: HPS1957

## Paper bundles included

### Epson Stylus Photo R1900

The Epson Stylus Photo R1900 is the ideal A3+ printer for professional photographers who demand high quality photographic prints. UltraChrome Hi-Gloss2 ink set for superior photo quality and durability

- Print high quality images up to A3+ in size
- Versatile media printing including roll paper support
- 8-colour ink system including orange ink for even more life-like skin tones
- Print directly onto CDs & DVDs
- Direct printing from digital cameras
- Dual USB 2.0 ports for additional PC connectivity
- Print resolution up to 5760 Optimised dpi

R1900 \*FREE paper bundle will include:

- C13S041332 - A4 Premium Semi Gloss Paper 20 sheets
- C13S041285 - A4 Premium Gloss Photo Paper 20 sheets
- C13S041352 - Watercolor-Radiant White A3+ - 20 Sheets

Total Value - \$127 RRP

\*Via redemption see citysoftware.com.au/promotions



\*BONUS paper valued at \$127!

EPSON

**\$1030**

SAVE \$69 off RRP  
WebCode: EPI1900

## A3+ colour photo printer

### Epson Stylus Photo R2400

The Epson Stylus Photo R2400 the ideal A3+ printer for black and white photo reproductions as well as full edge to edge A3 full colour prints.

- New EPSON UltraChrome K3 Ink with light, tight black for outstanding black and white photo reproductions
- 5760 Optimised DPI using EPSON's Resolution Performance Management (RPM) technology

EPSON

\*Via redemption see citysoftware.com.au/promotions



\*BONUS paper valued at \$233!

**\$1349**

SAVE \$149 off RRP  
WebCode: EPI2400

## Automatic duplex built-in

### Canon Pixma iP4500 Photo Inkjet Printer

Ideal photo and document printer with cost efficient individual ink tank system

- Print photos directly from digital cameras, no need for a PC
- 9600 x 2400 dpi resolution
- Built-in auto duplex compatible with paper feeding
- Precise, fast, high-quality direct printing on printable DVD/CD media



Canon

**\$143**

SAVE \$16 off RRP  
WebCode: CAN0664

## Think before you print... are you spending too much on ink?

### Kodak EasyShare 5300 Inkjet Printer

Kodak has developed a revolutionary inkjet system that gives you crisp, sharp black documents and brilliant photos that last a lifetime. Save up to 50% on everything you print compared to similar consumer inkjet printers.

- Print, copy, and scan
- KODAK lab-quality pictures that last a lifetime in as little as 28 seconds
- Large high-resolution 3" colour display for easy photo cropping
- Easy one-click photo printing from most memory cards
- Uses a convenient 2-cartridge, 6-ink system

\* Comparative information based on test results using Kodak Ultra Premium Photo Paper and ISO 24711 testing standards



Save up to 50% on everything you print\*

Kodak

**\$238**

SAVE \$11 off RRP  
WebCode: KOD5305



## HP Original Rewards

### How HP Original Rewards works

HP Original Rewards is an HP loyalty program designed for Small and Medium businesses. Earn HP Original Rewards points when you purchase original HP LaserJet and selected Inkjet print cartridges. You may use your accumulated HP Original Rewards points to redeem from the rewards catalogue.



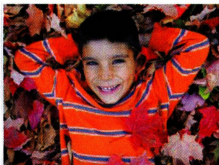
1 Purchase an original HP cartridge



2 Register your eCoupon number to earn points (ecoupons are affixed to HP Original cartridges carrying the HP Original Rewards sticker).



3 Accumulate points and redeem gifts from our exclusive rewards catalogue.



### Do you qualify?

#### How to see if your SMB is eligible:

HP Original Rewards is designed exclusively for small and medium businesses that regularly purchase HP LaserJet Print Cartridges, Inkjet Cartridges and Paper. To see if you qualify for the program, you must register either:

- Online at [hp.com.au/orplus](http://hp.com.au/orplus)
- Over the phone by calling toll free on 1800 00 47 00
- By downloading an application form and posting it to:

HP Original Rewards  
Locked Bag 7507  
McMahons Point NSW 2060

To register you will need to nominate 1 person (yourself or an employee) to represent your company to manage the HP Original Rewards account, including all redemption transactions. The nominated person will be issued with a unique member User ID and Password to gain access.

### What are the benefits?

- Membership is FREE
- Online access to your account 24/7
- Earn and accumulate points with every purchase of an HP Original cartridge
- Be rewarded with a fine selection of gift items such as:
  - HP Notebooks
  - Westfields vouchers
  - Movie vouchers
  - Home theatre systems
  - Digital Cameras

Visit the HP Original Awards website at [hp.com.au/orplus](http://hp.com.au/orplus) for more details

Go to [http://h30381.www3.hp.com/eng/info/terms\\_and\\_con\\_51.asp](http://h30381.www3.hp.com/eng/info/terms_and_con_51.asp) for terms and conditions. Note the displayed gifts are for illustration purposes. The featured contents may differ for each country. HP reserves the right to substitute the gift items at any time without prior notice.



## HP Toner Cartridges

Description	Webcode	Price
C3906A Black Toner	HP741	\$87
C4092A Black Toner	HPL4092	\$76
C4096A Black Toner	HPL4096	\$128
C4127X Black Toner	HPL4129	\$163
C4129X Black Toner	HPL4131	\$209
C7115A Black Toner	HPL7115	\$79
C7115X Black Toner	HPL7117	\$98
C8061X Black Toner	HPL8063	\$163
C9720A Black Toner	HPL9720	\$197
C9721A Cyan Toner	HPL9721	\$267
C9723A Magenta Toner	HPL9723	\$267
Q1338A Black Toner	HPL1338	\$195
Q2610A Black Toner	HPL2610	\$153
Q2612A Black Toner	HPL2612	\$89
Q2613A Black Toner	HPL2613	\$91
Q2613X Black Toner	HPL2614	\$114
Q2670A Black Toner	HPL2670	\$168
Q2683A Magenta Toner	HPL2683	\$217
Q3960A Black Toner	HPL3960	\$106
Q3961A Cyan Toner	HPL3978	\$127
Q3962A Yellow Toner	HPL3979	\$127
Q3963A Magenta Toner	HPL3981	\$127
Q3972A Yellow Toner	HPL3976	\$94
Q3973A Magenta Toner	HPL3977	\$94
Q5942A Black Toner	HPL5942	\$190
Q5942X Black Toner	HPL5943	\$287
Q5945A Black Toner	HPL5945	\$259
Q5949A Black Toner	HPL5949	\$91
Q5949X Black Toner	HPL5994	\$167
Q5950A Black Toner	HPL5950	\$226
Q5951A Cyan Toner	HPL5951	\$321
Q5952A Yellow Toner	HPL5952	\$349
Q5953A Magenta Toner	HPL5953	\$321
Q6000A Black Toner	HPL6000	\$97
Q6001A Cyan Toner	HPL6001	\$106
Q6002A Yellow Toner	HPL6002	\$106
Q6003A Magenta Toner	HPL6003	\$106
Q6470A Black Toner	HPL6470	\$168
Q6511A Black Toner	HPL6511	\$158
Q7581A Cyan Toner	HPL7581	\$217
Q7582A Yellow Toner	HPL7582	\$217
Q7583A Magenta Toner	HPL7583	\$217

## HP Ink Cartridges

Description	Webcode	Price
HP 78 Tri-Colour	HPD6578	\$48
HP 23 Tri-Colour	HPI1826	\$53
HP 45 Black	HPD095	\$43
HP 15 Black	HPD6645	\$41
HP 28 Tri-Colour	HPI8782	\$31
HP 27 Black	HPD8772	\$27
HP 56 Black	HPD6656	\$29
HP 57 Tri-Colour	HPI6657	\$48





## Ideal for home & family

### Wacom Bamboo Creative Fun 6 x 9 Black

Bamboo Fun is perfect for hobbies. Its simple, easy-to-use design lets you inspire yourself and other people. Retouch photos, draw, paint and be more expressive. It's the Bamboo for people who want to make their hobbies come alive. Bamboo Fun comes with a pen stand, USB cabling, a mouse and a tailored one-on-one tutorial. Create your world.



**\$262**

SAVE \$37 off RRP  
WebCode: WAC2005

## Best for students

### Wacom Intuos3 6 x 8 Tablet - Student\*

Intuos3 is the industry standard graphics tablet for digital art, animation, image editing and computer graphics. The Intuos3 features ExpressKeys and Touch Strip(s) can substitute all common modifiers and shortcuts, whilst the ergonomic pen delivers professional level functionality.

\*Student ID required



**\$327**

SAVE \$22 off RRP  
WebCode: WAC9983

## The tablet that's a screen

### Wacom Cintiq 12WX

Thin and light, the new Cintiq 12WX gives you the flexibility to work directly on screen as you would on paper. Easily rotate your display when working flat on your desktop to find the right position for your hand, or for greater comfort, recline the Cintiq 12WX on the desktop. Ergonomically designed for maximum comfort, it's even light enough for use on your lap.



**\$1648**

SAVE \$151 off RRP  
WebCode: WAC9977

## Office productivity made easy

### Microsoft Wireless Optical Desktop 2000

The Microsoft Wireless Optical Desktop 2000 features a compact, Comfort Curve keyboard that lets your hands rest naturally and comfortably. It offers a quiet, responsive, thin-profile keyboard with Media and Hot Keys for one-touch access to programs you use most. Completing the set is a wireless mouse with Microsoft Optical Technology for greater accuracy and control.

#### Wireless Keyboard

- Comfort Curve Design
- Media Keys and Hot Keys
- Spill-Resistant Design

#### Wireless Optical Mouse

- Comfortably designed for use in either hand
- Average 6+ Months of Battery Life
- Magnifier
- Optical technology

**Microsoft**



**\$73**

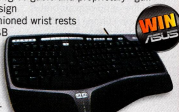
SAVE \$16 off RRP  
WebCode: MST8424

## Pamper your wrists

### Microsoft Natural Ergonomic Keyboard 4000

- Ergonomic "split design"
- Inbuilt Scroll wheel
- New key layout improved for Ergonomic enthusiasts
- New 14 degree gable and proprietary "gull wing" design
- New cushioned wrist rests
- Wired USB

**Microsoft**



**\$64**

SAVE \$15 off RRP  
WebCode: MST8406

## Take control in luxury

### Logitech Cordless Desktop MX 5500 Revolution

This is the only Cordless Desktop to feature the rechargeable MX Revolution hyper-fast scrolling laser mouse, and a dynamic keyboard display.

- Bluetooth wireless technology
- Dynamic keyboard display
- Logitech SecureConnect technology
- Soft, coated palm rest



**\$204**

SAVE \$45 off RRP  
WebCode: LOG3685

## The best choice for gamers

### Logitech G15 Gaming Keyboard

With the Logitech-exclusive GamePanel LCD, you can easily find out what server your friends are using to play online games. Create useful macros on the fly and play them back with a single press of a G-key. Illuminated characters allow you to play late into the night.



**\$113**

SAVE \$36 off RRP  
WebCode: LOG3664

## Designed for Windows Media Center

### Microsoft Wireless Entertainment Desktop 8000

The Microsoft Wireless Entertainment Desktop 8000 is the ultimate rechargeable keyboard and mouse for Windows Vista and PC entertainment. Designed to make it easier than ever to control PC media from your desk, your lap - or even from the comfort of your couch.

**Microsoft**



**\$364**

SAVE \$85 off RRP  
WebCode: MST8456





## Dongle-free bluetooth mouse

## Microsoft Bluetooth Notebook Mouse 5000

This is the Microsoft's most portable wireless notebook mouse that connects directly to a Bluetooth PC without a transceiver, freeing up USB ports for other devices.

- Transceiver-free and confident wireless connection to your Bluetooth PC.
- More responsive, more precise, and smoother tracking
- Battery light indicates when your battery is running low and an on/off switch helps you conserve power.
- 4 Buttons

**\$57**SAVE \$12 off RRP  
WebCode: MST8245

## Integrated trackball

## Wireless Multifunction Cordless Presenter

Control PowerPoint presentations without being tied down to your computer from 50 feet away.

- Built in laser pointer
- USB plug & play
- 2.4GHz Wireless
- Built in Trackball & Soft Keyboard



NEW

**\$49**SAVE \$40 off RRP  
WebCode: SIG0009

## Charge whilst in use

## Microsoft Mobile Memory Mouse 8000

This comfortable, ground-breaking mouse is the most advanced mobility tool available. Its transceiver also has a 1 GB Flash Memory, which frees up USB ports and lets you easily back up and transfer files. You can even continue to work while your mouse is charging.

Microsoft

**\$122**SAVE \$27 off RRP  
WebCode: MST8472

## Natural ergonomic design

## Microsoft Natural Wireless Laser Mouse 6000

- Revolutionary Ergonomic Design
- Instant Viewer
- 4-Way Scrolling
- Magnifier
- Battery Life Indicator

Microsoft

**\$78**SAVE \$22 off RRP  
WebCode: MST8438

## Present in style

## Logitech 2.4GHz Cordless Presenter

Take advantage of its 50 foot range to control your presentations while moving around an auditorium with confidence. A built-in LCD timer with vibration alerts helps you effectively manage your time. Storable receiver, carry case and On/Off button for complete portable control.

**\$72**SAVE \$27 off RRP  
WebCode: LOG3495

## Best for gaming enthusiasts

## Logitech G9 Laser Mouse

The G9 saves mouse settings in onboard memory, store up to 5 profiles (including keyboard macros, dpi settings, and LED colour) on the mouse and play your way

- Interchangeable Grips
- 3200 dpi laser engine with Full Speed USB
- MicroGear Precision Scroll Wheel
- Custom-colour LEDs

**\$119**SAVE \$50 off RRP  
WebCode: LOG3657

## Extra long battery life

## Logitech MX 620 Cordless Laser Mouse

Scroll through 10,000 lines in just 7 seconds - and stop on a dime.

- Experience pixel-perfect precision and smoother cursor control on virtually all surfaces.
- Go up to a year without replacing batteries - longer if you use the on/off button. A battery power indicator eliminates surprises.

**\$70**SAVE \$29 off RRP  
WebCode: LOG3641



Great for skype

## Verbatim USB VoIP Headset

Verbatim's USB VoIP headset is all you need to get up and running with VoIP. Designed for the business professional, the headset features lightweight and durable construction for extra comfort during prolonged wear. USB 2.0 connectivity means no sound card is required—simply plug and play!



Verbatim

**\$33**

SAVE \$6 off RRP  
WebCode: VBM6000

MSN Messenger & Skype

## Mini USB Notebook Webcam

Add a whole new level of communication to your online chatting sessions with the new Mini USB Notebook Webcam

- 2 megapixel lens
- Built in microphone
- Take quick photos with the snap shot button



NEW

**\$34**

SAVE \$35 off RRP  
WebCode: SIG0017

Memories with you at all times

## Kaiser Baas 1.5" Digital Photo Key Ring - Black

The Kaiser Baas Digital Photo Key Ring is the ideal gift. It is perfect for displaying holiday photos, baby shots or party pictures and presenting them to friends and family in a slideshow.

Smaller than a matchbox, it can store up to 70 pictures, offering a different image every time a person looks at it.



Kaiser Baas

**\$29.95**

WebCode: KAB0007

Control up to 15 devices

## Logitech Harmony One Advanced Universal Remote

Logitech knows who you are. You have a half-dozen remotes on the coffee table. And you're the only one in the family who knows how to use them. Logitech can help with the Harmony One Advanced Universal Remote. Enjoy a full colour touch screen, intuitive button layout and an ergonomic design. So easy to use, the whole family will love it.

Controls up to 15 infrared devices.



NEW

Limited Stock. Logitech

**\$366**

SAVE \$33 off RRP  
WebCode: LOG3681

High quality Carl Zeiss optics

## Logitech QuickCam Pro 9000

With the Logitech QuickCam Pro 9000 you can enjoy image-perfect detail and clarity. Carl Zeiss optics and autofocus keep images razor-sharp, even in extreme close-ups.

- Ultra-high resolution 2-megapixel sensor with RightLight 2 Technology
- 24-bit true color
- Up to 1600 x 1200 pixels
- Up to 30 frames per second
- 8 million pixels still image capture
- Built-in microphone with RightSound Technology



**\$108**

SAVE \$41 off RRP  
WebCode: LOG3650

Great value webcam for notebooks

## Microsoft LifeCam NX-3000

- VGA video resolution (640 x 480 pixels)
- High Definition 1.3 megapixel still photos (1280 x 960 pixels, interpolated)
- Built-in microphone with acoustic noise cancellation
- Automatic audio control for enhanced sound clarity

Microsoft



**\$58**

SAVE \$21 off RRP  
WebCode: MST8476

TV, movies, photos and music streamed with wireless-N

## Linksys DMA2100 Media Center Extender

Access movies, your music library, family photos and HDTV programming from your Media Center PC and stream it all to your living room TV or home theater. New Linksys Media Center Extenders give you access to the entertainment content on your Microsoft Windows Vista Premium or Ultimate PC to enjoy in the comfort of your living room. Pause or rewind live TV, record sporting events or episodes of your favourite TV shows and save them for later viewing. Quickly navigate through elegant menus and programming guides.

- High speed, dual-band Wireless-N enables you to stream content from virtually anywhere in your home.
- Stream live TV content, movies, photos and music from your Media
- Center PC on your living room HDTV and home theater
- Includes learning remote control
- Integrates your TV and A/V receiver controls

DMA2200 - Integrated DVD Player (LNK6271) \$372



LINKSYS®

**\$316**

SAVE \$43 off RRP  
WebCode: LNK6270



## High capacity SD cards

## Verbatim 8GB Secure Digital (SDHC) Card

SD is an increasingly popular storage choice among Digital Still Camera, Digital Video Camera, MP3 player, and handheld device makers.

- Ultra Compact (Postage Stamp Sized) Form Factor
- Write Protect Switch prevents accidental data deletion
- Verbatim Limited Lifetime Warranty

1GB (VBM6033) \$12

2GB (VBM6034) \$23

4GB (VBM6035) \$44

**\$92**
**SAVE \$22 off RRP**  
 WebCode: VBM6061

## Popular capless swivel design

## Verbatim 2GB Store 'n' Go Mini with Swivel Cap

The Store 'n' Go Mini is Verbatim's first capless USB drive. It features a swivel designed cap which is attached to the drive, so the days of lost caps are gone! Versatile, yet easy to use, simply plug the Mini Store 'n' Go into any USB port, then drag and drop your folders and files.

1GB (VBM6052) \$18

4GB (VBM6053) \$32

8GB (VBM6054) \$58

Verbatim

**\$28**
**SAVE \$11 off RRP**  
 WebCode: VBM6051

## Great for school

## Bean USB Flash Drive 8GB Green

This colourful and ergonomic design is a nice thing to look at, and a pleasant thing to have. It leaves boredom behind and invites interested glances. It's a friendly, convenient and cosy, designed especially for young people who like every-day objects closed in unusual soft shapes.

8GB Blue (SIG0013) \$55

8GB Orange (SIG0011) \$55

4GB Orange (SIG0014) \$33

4GB Green (SIG0015) \$33

4GB Blue (SIG0016) \$33

**\$55**
**SAVE \$24 off RRP**  
 WebCode: SIG0012

## The market leading flash drive

## SanDisk Cruzer Micro U3 8GB

SanDisk Cruzer Micro design is a small, smart and secure USB Flash Drive.

- Small, compact light weight design
- Never retractable USB slider eliminates the need for caps
- U3 smart enables you to take your portable applications on the go

2GB (SAN0061) \$21

4GB (SAN0062) \$36



SanDisk

**\$61**
**SAVE \$18 off RRP**  
 WebCode: SAN0103

## World's fastest flash drive

## SanDisk Extreme Ducati 4GB USB Drive

## Passion for Performance

SanDisk has teamed with Ducati Corse MotoGP to launch the most unique USB Flash Drive to date.

- Distinctive design inspired by Ducati motorcycles.
- Fast 20MB/sec sequential read/write speed.
- The fastest consumer USB Flash Drive SanDisk offers.
- Massive 4GB capacity



SanDisk

**\$64**
**SAVE \$15 off RRP**  
 WebCode: SAN0104

## Edit new HD video formats

## D-Link DNS-323 2 Bay Network Storage Enclosure

- Secure and share your digital files
- Insert either one or two SATA hard drives without using any tools or attaching any cables
- Protect your important files by making regular backups to mirrored hard drives

DNS-313 1 Bay Enclosure (DLK0313) \$190



D-Link

**\$327**
**SAVE \$73 off RRP**  
 WebCode: DLK0066

## 2 USB ports for additional storage

## Linksys NAS200 - Network Storage System with 2 Bays

Now you can quickly and easily add storage space onto your network with the Linksys Network Storage System. This stand-alone network appliance features two available SATA hard drive bays so you can attach as much storage as you need now, and add more later as your storage needs grow.



LINKSYS

**\$207**
**SAVE \$42 off RRP**  
 WebCode: LNK6256

## Fits into into any USB port with ease

## Sly'd USB Flash Drive (Blue) 2GB

This simple and clean design houses an intriguing mechanism which allows the flash drive to be opened with just two fingers.

## Features:

- Designed to utilise the high bandwidth of USB 2.0 interface
- Capacity 2GB
- Bootable
- Small Footprint 33mm x 12.5mm x 6mm (LxWxH)

2GB Pink (SIG0003) \$18

2GB Green (SIG0004) \$18

2GB Silver (SIG0005) \$18

**\$18**
**SAVE \$31 off RRP**  
 WebCode: SIG0002

## Neat &amp; tidy, ready for business

## Tango USB Flash Drive 4GB

Pleasant, soft shape outlined by bold metal frame. Smooth feel. Classy, charming and slightly avant-garde.

## Features:

- Designed to utilise the high bandwidth of USB 2.0 interface
- Capacity 4GB
- No Driver Required, except on Windows 98SE
- Bootable

8GB (SIG0006) \$52

**\$28**
**SAVE \$29 off RRP**  
 WebCode: SIG0001





## Compact size & long battery life

### Logitech Pure-Fi Anywhere Compact Speakers for iPod

The Pure-Fi Anywhere speaker system uses a unique combination of speaker drivers to deliver clear sound with maximum bass and minimal distortion. Its compact size and long battery life make it the ideal companion to your iPod.



iPod not included.

**\$165**

SAVE \$64 off RRP  
WebCode: LOG3668

## Radio for your iPod

### iHome iH10 - FM Table Radio

- Classic rotary knobs for precise, intuitive control
- Wood speaker cabinet with tuned speaker chamber technology for richer sound
- Plays and Charges your docked iPod when connected to AC adaptor
- Universal dock plays and charges 5G, nano, photo, mini and 4G iPods



iPod not included

iHome

**\$132**

SAVE \$17 off RRP  
WebCode: IH00003

## Wake up in style

### iHome iH8 White iPod AM/FM Clock Radio

iHome8 Dual Alarm Clock Radio for your iPod or MP3 player with Remote Control and 12 AM/FM presets and equaliser. What better way to rise and shine to your favourite tunes



Black (IH00002)  
**\$176**

iHome

iPod not included.

**\$176**

SAVE \$13 off RRP  
WebCode: IH00001

## Small iPod with one very big idea

### Apple iPod nano 8GB Pink

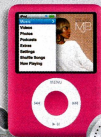
It's the small iPod with one very big idea: Video. Now the world's most popular music player lets you enjoy TV shows, movies, video podcasts, and more. The larger, brighter display means amazing picture quality.

In eye-catching colors, iPod nano is stunning all around.

Black (APP0337) **\$246**

Green (APP0336) **\$246**

Blue (APP0335) **\$246**



Apple Authorised Reseller

**\$246**

WebCode: APP0380

## Features microSD expansion slot

### SanDisk e250 2GB MP3 Player

The Sansa e200 Series MP3 players are the flagship products of SanDisk's audio line. Created by the leaders in flash memory, this flash-based player provides everything you need for music, photo, and video clip playback. The very attractive, sleek design includes a 1.8 TFT colour screen with advanced navigational features and an easy to use interface.

4GB (SAN0055) **\$156**

8GB (SAN0083) **\$206**



SanDisk

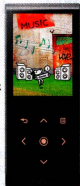
**\$132**

SAVE \$17 off RRP  
WebCode: SAN0054

## Stylish slim design

### Samsung T10 MP3 Player 4GB

- Slim & portable (7.9mm/ 43g)
- 2" QVGA (320 x 240) TFT LCD
- 30 Hrs music & 4 Hrs movie battery playback
- Bluetooth 2 headset support
- WMV/MPEG4/MP3/WMA/OGG/JPEG/TXT playback supported



**\$157**

SAVE \$21 off RRP  
WebCode: SAM3424

## Easy to use

### Clip 2GB MP3 Player

Listen to your favourite music on the go with the Clip 2GB MP3 player

- Simple & trendy Clip design
- 128 x 32 OLED LCD display
- Built-in Lithium rechargeable battery
- Size: 5.5 x 2.3 x 1.6cm
- Includes Stereo Headphones

NEW



**\$39**

SAVE \$30 off RRP  
WebCode: SIG0010

## The speakers your iPod have been waiting for

### B&W Zeppelin iPod Speakers System

Here are the speakers your iPod has been waiting for. Zeppelin is an integrated iPod speaker system from Bowers & Wilkins, makers of the speakers that much of the music on your iPod will have been monitored on. B&W creates technologies and systems that world-leading studios depend on and that find their way into even its most affordable speakers.

Zeppelin will fill a room with crisp, deep, lifelike stereo sound, and deliver musical detail that you won't believe your iPod could deliver. That's because the two have so much in common: blissfully simple design and world-leading technologies that let you get the most out of your music.

NEW



iPod not included.

Bowers & Wilkins

**\$999**

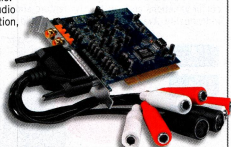
WebCode: BOW0001

## 4-in/4-out audio card with digital I/O & midi

### M-Audio Audiophile 192 Pro Audio Sound Card

The Audiophile 192 continues the legacy of M-Audio's industry-standard Delta audio card line. Building on our Audiophile 2496, one of the world's most popular audio cards, the Audiophile 192 features high-definition 192kHz sampling rate, digital I/O, balanced analog I/O and an amazing signal-to-noise ratio. The Audiophile 192 represents a new benchmark in audio performance that's as good as it gets for music production, mastering and critical listening.

- Up to 24-bit/192kHz audio
- 2 x 2 balanced analog I/O
- S/PDIF digital I/O with PCM and surround
- Direct hardware input monitoring
- Includes Ableton Live Lite 4 music production software
- 16-channel MIDI I/O



**M-AUDIO**  
A part of **Avant**

**\$243**

**SAVE \$21 off RRP**  
WebCode: PWR0254

## Sound for the music enthusiasts

### Creative Sound Blaster X-Fi Elite Pro

The Sound Blaster X-Fi Elite Pro features professional-quality digital-to-analog converters (DACs) with 116dB SNR, plus an I/O module with a comprehensive selection of connectivity for audio creation with easy-to-use control knobs for the X-Fi 24-bit Crystalizer, X-Fi CMSS-3D (Creative Multi-Speaker Surround), 3DMIDI, and EAX.

The Sound Blaster X-Fi Elite Pro also features 64MB of on-board X-RAM - audio memory dedicated to higher gaming audio quality and performance, in addition to a built-in pre-amp for direct recording, and high-impedance inputs for electric guitars. The "top of the line" Sound Blaster X-Fi solution, the Elite Pro includes all of the standard features, application software, power and performance capabilities of the entire family of Sound Blaster X-Fi cards, in one ultimate solution.



**\$516**

**SAVE \$83 off RRP**  
WebCode: CRE0297

## Cinema Quality 5.1 Speaker System

### Logitech Z-5500 Digital Speakers

For the ultimate entertainment experience: Logitech's THX-certified, 500 watt Z-5500 Digital 5.1 speaker system delivers high-fidelity digital sound for DVD players, PCs, video game consoles, and more.

- Total Peak Power: 1010 watts
- Satellites: 317 watts RMS
- Subwoofer: 188 watts RMS
- Dolby Digital and DTS compatible
- Wireless remote included



**\$456**

**SAVE \$243 off RRP**  
WebCode: LOG3466

## World class audio production software

### Pro Tools M-Powered 7

Pro Tools M-Powered 7 is the serious music production choice for power, compatibility, options and ease of use without spending serious money, all this while expanding your creative hardware options to nearly 20 M-Audio interfaces.

- Professional recording, editing and mixing
- Easy collaboration
- Plug-ins Galore



**\$368**

**SAVE \$26 off RRP**  
WebCode: PWR0255

## Transfer tape & vinyl to PC

### XPSound XP201 - Phon PreAmp

The XP201 provides a combination of hardware and software to achieve high quality transfer of old records and cassettes to your home desktop PC or laptop in addition to offering a handy high quality microphone pre amp and headphone amplifier. The included software (Windows PC only) "Diamond Cut 32 V4.0" allows users to professionally edit their recorded audio.



**\$97**

**SAVE \$102 off RRP**  
WebCode: XPS0001

## Excellent value 2.1 system

### Edifier M3200 2.1 Powered Speaker System

A wooden enclosure sub-woofer with 2 way 'slim-lady' satellites provides for a very cost effective audio solution for multiple applications. Powerful deep bass & exceptional highs for optimized PC Gaming.

**Edifier**



**\$85**

**SAVE \$15 off RRP**  
WebCode: EDI0002





## Sandisk Memory Cards

### Standard SD

- 1GB (SIM0388) \$11
- 2GB (SAN0030) \$19
- 4GB (SAN0115) \$36
- 8GB (SAN0116) \$72



### Ultra II SD

- 1GB (SIM5987) \$23
- 2GB (SIM0457) \$35
- 4GB (SAN0098) \$57
- 8GB (SAN0101) \$101



### Ultra II Compact Flash (CF)

- 1GB (SIM1002) \$24
- 2GB (SIM0691) \$35
- 4GB (SAN0023) \$57
- 8GB (SAN0037) \$101



### Memory Stick Pro Duo

- 1GB (SAN0025) \$30
- 2GB (SAN0028) \$34
- 4GB (SAN0053) \$74
- 8GB (SAN0120) \$146



### Ultra II Memory Stick Pro Duo

- 1GB (SAN0065) \$26
- 2GB (SAN0046) \$46
- 4GB (SAN0066) \$61



### Extreme III SD

- 1GB (SAN0111) \$32
- 2GB (SAN0112) \$35
- 4GB (SAN0125) \$58
- 8GB (SAN0126) \$114



### Extreme III Compact Flash

- 2GB (SAN0106) \$44
- 4GB (SAN0107) \$66
- 8GB (SAN0108) \$111
- 16GB (SAN0110) \$216



Sandisk

## Best value photo frame

### Ality 7" White Digital Photo Frame

This 7" digital photo frame comes in a kaleidoscopic array of bright and fun colours. Simply insert a memory card directly into the built-in slot of Color PIXXA, and the possibilities for interchangeable display settings and picture frame modes are endless.

Auto Tilting

No computer required

Also available in Pink, Blue, Green, Beige & Black



NEW

**\$113**

SAVE \$35 off RRP  
WebCode: ALI1001

## Integrated optical image stabilizer lens

### Canon Digital IXUS 80IS Blue

The IXUS 80 IS has powerful presence and performance and will certainly stand out in a crowd. Advanced technologies for optimum, spontaneous capture showcased in the IXUS 80 IS include Optical Image Stabilizer, Motion Detection Technology and Noise Reduction Technology. These combine to ensure blurring is controlled in an intuitive fashion, for amazing pictures. The stunning colour variations are a distinctive feature and are ideal for people passionate about expressing their individuality. Available in Blue, Brown, Gold, Pink & Silver.

- 8 Megapixel
- 3x Optical Zoom
- 2.5" LCD Screen

NEW



Canon

**\$316**

SAVE \$60 off RRP  
WebCode: CAN0691

## Great gift idea

### Kodak EasyShare C813 Zoom

- 8.2 MP camera for prints up to 76 x 102 cm
- 3X optical zoom lens
- Digital image stabilisation
- High ISO, up to 1250
- HD still capture
- Video with sound and print options

- 8 Megapixel
- 3x Optical Zoom
- 2.4" LCD Screen

Kodak



**\$140**

SAVE \$29 off RRP  
WebCode: KOD0813

## Affordable quality

### Sony Cyber-shot DSC-S730

User-friendly controls and highly detailed photos are available at an incredible value in the DSCS730. The compact body features 7.2 megapixel resolution, 3x optical zoom lens, and a bright, 2.4" LCD screen for reviewing your photos with ease.

- 7.2 Megapixel
- 3x Optical Zoom
- 2.4" LCD Screen

NEW



SONY

**\$173**

SAVE \$6 off RRP  
WebCode: SNY6899

## Waterproof & pressure resistant

### Olympus Tough 1030SW

Fashioned for everyday punishment, the Tough 1030SW is the toughest camera on the market yet. Offering robust shockproof, waterproof, and pressure-resistant construction, the new sleek and stylish frame is not only ideal for capturing those perfect party moments but it takes outdoor use and underwater adventure to a new level.

Black (OLY1417) \$527

- 10.1 Megapixel
- 3.6x Optical Zoom
- 2.7" LCD Screen

OLYMPUS

NEW



**\$527**

SAVE \$72 off RRP  
WebCode: OLY0146

## Point & shoot professionalism

### Canon PowerShot G9

The PowerShot G9 delivers the highest image quality with a 12.1 Megapixel ultra-high definition mega CCD. Also featuring RAW mode, you can enjoy complete flexibility when manipulating your images. The 6x optical zoom with Optical Image Stabilizer enables long range steady shooting with pixel perfect results.

- 12.1 Megapixel
- 6x Optical Zoom
- 3" LCD Screen

Canon



**\$704**

SAVE \$145 off RRP  
WebCode: CAN0675



Best Value Sat-Nav around!

## TomTom ONE Satellite Navigation System

- 3.5-inch full colour TFT LCD touch screen (320 x 240 pixels, 64K colours)
- 1GB internal memory
- Internal Lithium-Ion battery (2 hours operation)
- 9.6cm x 8.12cm
- Weighs only 175g
- Quick and easy start-up
- Wallet-sized device
- Loud & clear spoken instructions in 36 languages
- Complete guidance to destination
- Direct access to emergency numbers and directions to nearest assistance (road assistance / police station / hospital)
- Start navigating in seconds with a high sensitivity GPS receiver
- And TomToms QuickGPSfix Service
- Automatically re-calculates route if detour from the planned route



**\$299**

WebCode: TOM0012

GPS Software for your Mobile

## CoPilot Live 7 For Windows Mobile Device

CoPilot Live 7 gives you powerful, easy-to-use GPS navigation on your mobile device, which operates just like a dedicated or in-dash system. CoPilot Live 7 guides you to where you need to be with spoken and on-screen directions whether you are in a car, cycling, or on foot, taking advantage of the latest GPS navigation technology.



**\$198**

SAVE \$71 off RRP  
WebCode: CPL0002

Budget handheld organiser

## HP iPAQ 112 Classic Handheld

Keep your life productive and organised with the HP iPAQ 112 Classic Handheld. Including Windows Mobile 6 with Outlook and Office Mobile, integrated Wi-Fi and Bluetooth 2.0 EDR networking, packed in its streamline, stylish body. Its large touch screen display also gives you ample room to view all your work and entertainment.



**\$376**

SAVE \$23 off RRP  
WebCode: CQ06094

Broadband in your pocket

## Palm Treo 750

The Palm Treo 750 smartphone helps you stay connected on your terms. It combines phone, email, messaging, web, and Windows Mobile 6 with Palm enhancements that make it easier than ever to stay productive. Receive email from multiple business or personal accounts and access the web right from where you're standing on fast, 3G networks.



\*BONUS  
Palm Bluetooth  
Headset \$99  
Value

\*See citysoftware.com.au/promotions

**\$896**

SAVE \$103 off RRP  
WebCode: USR7507

Receive instant messages anytime

## ASUS M530w Smartphone

In order to provide business users with the mobility and the versatility of a mobile office, ASUS has designed the new ASUS M530w Smart Phone. Packed with innovative features, the ASUS M530w allows users to send and receive messages instantly anywhere - providing vital information for users to make important and informed business decisions.



ASUS

**\$587**

SAVE \$42 off RRP  
WebCode: ASP0023

The best of both worlds

## HTC Touch Dual 3G PDA

Delivering a revolutionary touch experience that will change the way you use your phone, forever. Everything you need is at your fingertips. With the flick of your thumb, the touch screen slides to reveal a handy smart-sized keyboard. If you prefer to touch, then the TouchFLO interface allows you to quickly guide through emails, messages, music and images at the touch of a finger, making navigation a breeze.



**\$862**

SAVE \$37 off RRP  
WebCode: HTC0004

Masterpiece of style

## Nokia 8800 Arte Mobile Phone

The Nokia 8800 Arte Mobile Phone features a design rich in timeless elegance combined seamlessly with the latest technology. It has been crafted using premium materials with an exquisite attention to details to feel solid and substantial. You gain a sense of exclusivity with stylish features such as tap-for-time, turn to mute, and living wallpapers.



NEW

NOKIA

**\$1498**

SAVE \$301 off RRP  
WebCode: NOK0040

Works with any 3.5mm audio jack

## Verbatim Bluetooth Headset

Free yourself from the restraints of cords and enjoy crystal clear digital wireless audio reception with Verbatim's Bluetooth Stereo Headphones. Complete with a stereo transmitter, the headphones allow you to wirelessly connect to any audio device with a 3.5mm audio jack, including iPods and MP3 players, CD and DVD players, computers etc.



Verbatim

**\$86**

SAVE \$13 off RRP  
WebCode: VBM0609



1300 658 600



citysoftware.com.au



pick up point

Experience surround graphics for design, gaming and office productivity

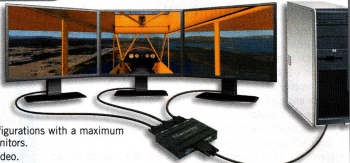
## Matrox TripleHead2Go Digital Edition

TripleHead2Go Digital Edition delivers the ultimate surround graphics experience for professionals and gaming enthusiasts alike. This versatile new product enables users looking to add three digital monitors to their workstation, desktop computer or notebook with a maximum resolution of up to 3840x10241 (triple 1280x1024).

- Features a dual-link digital input for notebooks, workstations
- Brings digital monitor support to systems with an analog (VGA) output.
- Flexible device supports both dual-monitor configurations at a maximum resolution of up to 3840 x 1200 (2x 1920x1200) 1 and triple-monitor configurations with a maximum resolution of up to 3840 x 1024 (3x 1280x1024) with digital or analog monitors.
- Harness your existing graphics hardware's full capabilities for 2D, 3D and video.
- Experience Surround Gaming by expanding supported 3D games across three displays.
- Experience Surround Graphics and execute your workload faster by expanding your desktop across three displays.
- Includes Matrox Monitor Bezel Management software feature for an enhanced gaming experience.

\*PC, monitors & monitor cables not included

Analog Edition (MAT5017) \$474



**matrox**  
Graphics for Professionals

**\$548**

SAVE \$11 off RRP  
WebCode: MAT5016

### Entry level 19" LCD

## Acer X193WB 19" Widescreen LCD Monitor

Everything is bigger and better on the Acer X193WB. The Panoramic viewable display is ideal for watching DVD movies – transporting you from your home into a small cinema. You will also be able to display 2 full pages of Microsoft Office Applications.



1440 x 900  
Resolution  
5ms  
Response Time  
300 cd/m2  
Brightness  
2000:1  
Contrast Ratio

**\$284**

SAVE \$105 off RRP  
WebCode: ACM0095

### Delivers vivid colors and detail

## ASUS VW193T 19" Widescreen LCD Monitor

The VW193T LCD monitor can accommodate multiple Windows on screen to increase productivity.



1440 x 900  
Resolution  
5ms  
Response Time  
300 cd/m2  
Brightness  
1900:1  
Contrast Ratio

**\$327**

SAVE \$72 off RRP  
WebCode: ASM0027

BONUS  
ASUS  
Broadband  
Router \$69  
Value

### Fast response and true blacks

## LG L196WTQ-BF 19" Widescreen LCD Monitor

The L196WTQ-BF is the world's first picture enhancing Chip for LCD Monitor. LG's real colour management (RCM) expresses more natural colours which are enhanced by the monitor's ultra high contrast ratio.



1440 x 900  
Resolution  
2ms  
Response Time  
300 cd/m2  
Brightness  
3000:1  
Contrast Ratio

**\$327**

SAVE \$111 off RRP  
WebCode: LGM1033

### Sharp picture quality

## Samsung Syncmaster 2043BW 20" Wide LCD Monitor

Replacing the highly successful 205BW Plus, the 2043BW is the perfect monitor for the office environment, boasting a height adjustable, pivotable stand for excellent ergonomic performance.



1680 x 1050  
Resolution  
5ms  
Response Time  
300 cd/m2  
Brightness  
1000:1  
Contrast Ratio

**\$352**

SAVE \$57 off RRP  
WebCode: SAM2143

### Excellent performance & support

## Acer X223WB 22" Widescreen LCD Monitor

This whopping big 22" screen is ideal for watching DVD movies, playing Games, internet browsing, graphic design, IT programming, as well as for audio production requiring oodles of real estate.



1680 x 1050  
Resolution  
5ms  
Response Time  
300 cd/m2  
Brightness  
2500:1  
Contrast Ratio

**\$364**

SAVE \$135 off RRP  
WebCode: ACM0093

### Super high resolution

## Samsung Syncmaster 245T 24" Wide LCD Monitor

Replacing the highly successful 244T, the 245T is the perfect monitor for environments that demand the very best image quality, in areas such as CAD/CAM, desktop publishing and medical applications.



1920 x 1200  
Resolution  
5ms  
Response Time  
300 cd/m2  
Brightness  
1000:1  
Contrast Ratio

**\$996**

SAVE \$203 off RRP  
WebCode: SAM4245



Compact & light in size & price

## Toshiba TDP-P9 Projector

- Mobile for business presentations
- Compact and light: 1.3 kg
- XGA 1,024 x 768 Resolution
- 2,000 ANSI-lumens
- 2,000:1 Contrast
- 4:3 switchable to 16:9
- Lamp Life up to 3,000 hours in ECO mode
- D-sub 15, USB, S-video, composite video, stereo mini jack, USB Reader



**39%**  
off RRP

**TOSHIBA**

**\$1586** SAVE \$1054 off RRP  
WebCode: TOS1604

Super bright lamp

## Toshiba EW-25 Projector

- WXGA 1,280 x 800 Resolution
- 2,600 ANSI-lumens
- 2,000:1 Contrast
- Lamp Life up to 3,000 hours in ECO mode
- 2 x D-sub 15, S-video, composite video, stereo mini jack



**\$2574** SAVE \$726 off RRP  
WebCode: TOS1600

Entry level projector

## ViewSonic PJ503 Projector

The ViewSonic PJ503D weighs only 2.5KG but packs big power into its compact package. With native SVGA 800x600 resolution and 1,500 lumens, the PJ503D is bright and powerful enough for virtually any situation. Advanced video features such as progressive scan and 3:2 pull down deliver smooth, crisp video performance.



**\$615** SAVE \$284 off RRP  
WebCode: VIE5011

Excellent all rounder

## Acer P1265 Projector

- WXGA+ 1,440 x 900 Resolution
- 2,400 ANSI-lumens
- 2,000:1 Contrast
- Lamp Life up to 4,000 hours in ECO mode
- D-sub 15, S-video, composite video, stereo mini jack, DVI



**\$1121** SAVE \$678 off RRP  
WebCode: ACP1265

Great for schools

## Epson EMP-S5 Multimedia Projector

Designed for enjoying larger than life images that fill your office, classroom or home. The new EMP-S5 Projector provides improved brightness, superb image quality and multimedia capability at an affordable price.

- 4000 Hour Lamp Life (Low Brightness)
- 2000 ANSI Lumens
- 400:1 Contrast Ratio
- 800 x 600 Resolution
- 4:3 Aspect Ratio



**FREE**  
Lamp  
\$269  
Value

\*See csw.com.au/promotions

**\$967** SAVE \$232 off RRP  
WebCode: EMP0005

Phenomenal price

## Mercury AV HDMI Cable 1.5m

You can depend on the performance and reliability of Mercury AV cables to enhance your audio visual experience significantly. Mercury AV is a premium cable solution for your Home Cinema or AV system – built to impress with superior sound and picture quality



3m (MER0002) \$48  
5m (MER0003) \$62

**\$34** SAVE \$5 off RRP  
WebCode: MER0001

For business & leisure

## 2C See IT 84" Projector Screen

The workhorse of the range, the See IT is a reliable, well priced pull down screen that gives you all the flexibility of the Switch IT but at a red hot price. Suitable for use in all sorts of places, and with any sort of output, from the overhead projector to computer games, the See IT will make what you are looking at bright, crisp and clear.



100" (TWC0002) \$187

**\$157** SAVE \$122 off RRP  
WebCode: TWC0001

Easy ceiling installations

## 2C Hang IT Projector Ceiling Mount

The perfect projector mounting solution which makes ceiling installations so easy. Suitable for any projector that can be inverted and has base mounting holes.

White (TWC0008) \$99



**\$99** SAVE \$30 off RRP  
WebCode: TWC0007





1300 658 600



citysoftware.com.au



pick up points

## Protect your equipment

### APC Back-UPS ES 700VA UPS

The Back-UPS ES offers our best value for protecting your home and home office computer systems. It provides battery backup power that allows you to work through short and medium length power outages. It also safeguards your equipment from damaging surges and spikes that travel along your power and phone lines.



APC

**\$213**

**SAVE \$46 off RRP**  
WebCode: APC3501

## Quick & easy transfers

### Belkin F3U150 - USB 2.0 File Transfer Cable

The Belkin USB 2.0 File Transfer Cable provides the perfect solution that allows you to copy files from PC to PC without the need to install drivers when used with Windows ME, 2000 or XP. Fantastic for the mobile user to transfer files to and from your laptop without the need of a complicated network setup. Designed with the computer novice in mind, it couldn't be easier!



BELKIN.

**\$65**

**SAVE \$34 off RRP**  
WebCode: BEL1150

## Powerful 2.0 speakers

### Logitech Z-10 Interactive Speaker System

Touch-sensitive multimedia controls and presets give you unprecedented control of your digital music. The innovative LCD display shows song information, a digital clock and other useful information.



Logitech

**\$197**

**SAVE \$102 off RRP**  
WebCode: LOG3593

## Economical Windows XP machine

### ALTECH Ariel Mini Tower

- Intel Pentium Dual Core E2160 1.8 GHz Processor
- Corsair 512MB 667MHz DDR2 RAM
- Samsung 160GB SATA II 7200rpm Hard Disk
- Samsung Dual Layer 20x DVD±RW Drive
- Intel GMA 950 Graphics Video Card
- 10/100 Ethernet, Serial
- 5.1Ch Audio
- Windows XP Home
- Genius LuxeMate 3000 Wireless Desktop

1 Year Warranty

**NEW**



**\$597**

**SAVE \$102 off RRP**  
WebCode: ALT1012

## Great for multimedia

### Acer Veriton L460 Ultra Small Form Factor

- Intel Pentium Dual Core E2160 1.8GHz Processor
- 1GB DDR2 RAM
- 160GB SATA Hard Disk
- DVD-RW Dual Layer Drive
- Intel GMA 3100 Graphics
- Gigabit Ethernet
- 4 x USB
- 6 Channel Audio
- Windows Vista Home Premium

**BONUS**  
Bundle USB TV Tuner



acer

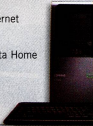
**\$776**

**SAVE \$82 off RRP**  
WebCode: ACB0210

## Great home PC

### Compaq Presario SR5440AN

- AMD Athlon 64 X2 5200+ 2.7GHz Processor
- 2GB PC2-6400 DDR2 SDRAM
- 320GB 7200 rpm SATA Hard Drive
- 16X DVD(+/-)R/RW DL LightScribe SATA drive
- nVidia GeForce 6150SE Graphics
- 10/100 Ethernet
- 6 x USB
- Card Reader
- Windows Vista Home Premium



**\$820**

WebCode: COP5440

## Ideal business machine

### Lenovo A55 Small Form Factor

- Intel Core 2 Duo E4400 2GHz Processor
- 1GB PC2-5300 DDR2 SDRAM
- 250GB 7200 rpm SATA Hard Disk
- DVD-RW Dual Layer Drive
- Intel GMA 3000 Graphics
- Gigabit Ethernet
- 8 x USB
- Windows Vista Business

Monitor not included

lenovo



**\$1039**

WebCode: IBD9801

## For the power user

### HP DC7800 Small Form Factor

- Intel Pentium Dual Core E6550 2.33GHz Processor
- 2GB 667MHz DDR2 Ram
- 160GB SATA Hard Disk
- DVD-RW Dual Layer Drive
- nVidia GF 8400GS 256MB
- Gigabit Ethernet
- 6 x USB
- Windows XP Pro



hp

**\$1524**

**SAVE \$49 off RRP**  
WebCode: HCP6671

**BUNDLED**  
20" LCD Monitor

Unbeatable value - perfect for students

## Toshiba Satellite Pro A200 Notebooks

The new Satellite Pro A200 is the right choice when it comes to style, performance and value. With its 15.4" widescreen display for vivid images and a range of the latest Intel Processors, it is designed to deliver maximum efficiency and mobility to serve any business needs.

1.86GHz  
Intel Core2 Duo CPU  
512MB DDR2  
Memory  
80GB  
Hard Drive  
15.4"  
Display

**BONUS**  
512MB Memory  
Total 1GB included



**TOSHIBA**

**\$761**

SAVE \$64 off RRP  
WebCode: TOS11601

Integrated webcam

## Compaq Presario C741TU Notebook

Find the perfect partner in the Compaq Presario 700 Notebook PC and get a lift in productivity with a value-packed laptop that meets your essential computing needs, simply and affordably.

1.6GHz  
Core 2 Duo CPU  
1GB DDR2  
Memory  
80GB  
Hard Drive  
15.4"  
Display

**BONUS**  
Sandisk 2GB  
USB Drive



**\$872**

SAVE \$76 off RRP  
WebCode: COP0740

XP downgrade disc included

## Toshiba Satellite Pro M200 Notebook

The new Satellite Pro A200 is the right choice when it comes to style, performance and value. With its 15.4" widescreen display for vivid images and a range of the latest Intel Processors.

1.83GHz  
Core 2 Duo CPU  
1GB DDR2  
Memory  
120GB  
Hard Drive  
14.1"  
Display

**TOSHIBA**



**\$1182**

SAVE \$28 off RRP  
WebCode: TOS11100

Excellent bundle

## HP Pavilion DV2711 Notebook

For sheer uniqueness, the special edition HP Pavilion dv2700 is hard to beat. The special 'verve' imprint draws inspiration from the fluidity of life - all specially laser-etched and protected by an inlaid moulding process.

1.6GHz  
Core 2 Duo CPU  
1GB DDR2  
Memory  
120GB  
Hard Drive  
14.1"  
Display

**BONUS**  
Mobility  
Pack



**\$1168**

SAVE \$180 off RRP  
WebCode: HPR2712

World's smallest 3.5G UMPC

## Fujitsu LifeBook U1010u

The LifeBook U1010 integrates both 3.5G and HSDPA provides you with more benefits than a regular notebook could ever offer.

• Weight 0.63kg • Embedded 3.5G UMTS/HSDPA (Next G compatible) • Made in Japan  
• 2 year pickup & return warranty

800MHz  
Intel A110 CPU  
1GB DDR2  
Memory  
40GB  
Hard Drive  
5.6"  
Display

**FUJITSU**  
LIFEBOOK



**\$1718**

SAVE \$281 off RRP  
WebCode: FUJ0064

Stop prying eyes

## Targus Privacy Screen 15.4" Widescreen



The Privacy Screen is designed to protect the information on your laptop from prying eyes. The Privacy Screen is a micro slim film that covers the laptop/ LCD screen and only allows normal viewing from directly in front of it, whilst also reducing glare from the screen and protecting it from damage.

\*Notebook not included



**\$96**

SAVE \$33 off RRP  
WebCode: TAR5031

Extensively tested formula

## Cleansafe TFT Screen Clean

For use on all coated and non coated laptop, notebook, TFT, plasma, LCD, PDA, GPS, mobile, basically any screen or monitor. Extensively tested by users and manufacturers, laboratory and industry tests have shown that Cleansafe will clean and protect all screen surfaces.



**\$16**

SAVE \$10 off RRP  
WebCode: CLE0001

Stylish notebook protection

## Maloperry 15.4" Notebook Bag Riding Rail Brown

Features:

- Removable lap top sleeve 15.4"
- Removable shoulder strap
- Inner padded pockets
- 2 front pockets
- Zip closer

**NEW**



**\$42**

SAVE \$17 off RRP  
WebCode: MAL0001





Ideal for students

## Logitech V470 Bluetooth Laser Mouse Blue

Move beyond the touch pad with a comfortable cordless laser mouse for PC or Mac notebooks enabled with Bluetooth wireless technology

- Laser precision
- Side-to-Side Scrolling Plus Zoom
- Battery life indicator
- Light, durable design
- Protective pouch included
- Receiver not included



**\$60**

SAVE \$19 off RRP  
WebCode: LOG3662

Magnetically shielded drivers

## Verbatim Portable USB Speakers

Lightweight and fully portable making it ideal for use while travelling. It is also perfect for desktop use. There is no requirement for an additional sound card as these speakers contain 2 x 1 1/4 inch pre-amplified magnetically shielded metal drivers giving you perfect digital sound.



Verbatim

**\$30**

SAVE \$8 off RRP  
WebCode: VBM6054

Environmentally friendly

## Targus Grove Top-Loading Laptop Case

This case has a padded laptop sleeve with scratch-resistant quilted lining & a security strap to fit up to 15.4" laptops. With plenty of storage options for your files and accessories, this case is ideal for any mobile user. As part of the Targus EcoSmart Initiative the materials for this case contain no PVC, which make it less toxic to the environment.



**\$64**

SAVE \$25 off RRP  
WebCode: TAR1603

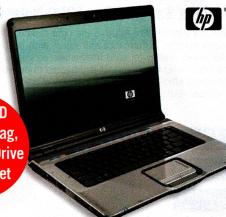
15.4" WXGA LCD screen

## HP Pavilion dv6754tx Notebook PC

Stylish fashion and impressive technology together is now in your reach. HP Pavilion dv6754TX Entertainment Notebook PC also showcases the brand new HP Imprint, a stylistic pattern embodying the precision and innovation of a HP notebook.

2.40GHz  
Core 2 Duo CPU  
3GB DDR2  
Memory  
250GB  
Hard Drive  
15.4"  
Display

**BUNDLED**  
with HP Bag,  
1GB USB Drive  
& Headset



**\$2027**

SAVE \$221 off RRP  
WebCode: HPR6759

Compact & portable

## Toshiba Portege M600

The new Portege M600 is specially designed for business users demanding stylish and affordable ultra-portable Notebook. It is compact, durable and secure - ideal for highly mobile individuals who want to travel.

2.0GHz  
Core 2 Duo CPU  
1GB  
Memory  
120GB  
Hard Drive  
13.3"  
Display



TOSHIBA

**\$1815**

SAVE \$110 off RRP  
WebCode: TOS1590

Lightest 14.1" All-in-One

## Fujitsu LifeBook S6510U

- Window Vista Business (XP Downgrade Included)
- 2yrs Pickup and Return Warranty
- 14.1" screen in unique 13.3" chassis
- Embedded 3.5G UMTS/HSDPA (Next G compatible)
- Made in Japan

2.4GHz  
Core 2 Duo CPU  
2GB DDR2  
Memory  
250GB  
Hard Drive  
14.1"  
Display



FUJITSU  
LIFEBOOK

**NEW**

**\$2587**

SAVE \$412 off RRP  
WebCode: FUJ0066

Lightest 12.1" All-in-One

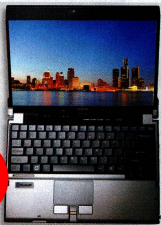
## Fujitsu LifeBook P8010

Offering more than just good looks, the LifeBook P8010 delivers outstanding performance and is packed with functional features too. For instance, the unique 5mm wide SlimEdge Design provides a wider display area and ensures pure viewing pleasure. In fact, with up to 6.1 hours of battery life and weighing a mere 1.3kg, it's the perfect companion for those on the go.

1.2GHz  
Core 2 Duo CPU  
2GB DDR2  
Memory  
250GB  
Hard Drive  
12.1"  
Display

- 12.1" screen in unique 10.6" chassis
- 2 Year Pickup and Return Warranty
- Biometric Fingerprint Scanner
- Spill resistant keyboard
- Made In Japan
- Weight 1.3kg

**NEW**



FUJITSU  
LIFEBOOK

**\$2596**

SAVE \$42 off RRP  
WebCode: FUJ0072



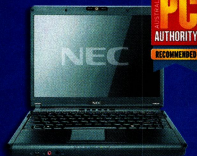
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## Ultra Portable Business Machine

### NEC VERSA S3300

- Intel Core 2 Duo T5250 1.5GHz Processor
- 1GB DDR2 667MHz Memory
- 160GB SATA 5400rpm Hard Drive
- DVD SuperMulti Drive
- Intel GMA X3100 Graphics
- 13.3" WXGA 1280x800 Super Shine LCD
- Gigabit Lan, 802.11 b/g Wi-Fi, BT
- Windows Vista Business
- Lightweight Magnesium-alloy Chassis
- 1 Year Limited On Site Warranty



**\$1027** SAVE \$592 off RRP  
WebCode: NEC0024

## Power Mobility Business Machine

### NEC VERSA M370

- Intel Core 2 Duo T5450 1.5GHz Processor
- 1GB DDR2 667MHz Memory
- 160GB SATA 5400rpm Hard Drive
- DVD SuperMulti Drive
- Intel GMA X3100 Graphics
- 15.4" WXGA 1280x800 Super Shine LCD Screen
- Web Camera, BT, Gigabit LAN, 802.11b/g Wi-Fi
- Windows XP Pro
- Keyboard with Numeric Keypad
- 1 Year Limited On Site Warranty



**\$1146** SAVE \$153 off RRP  
WebCode: NEC0023

## Entertainment & Mobility Workhorse

### NEC VERSA P7300

- Intel Core 2 Duo T5450 1.5GHz Processor
- 2GB DDR2 667MHz Memory
- 200GB SATA 5400rpm Hard Drive
- DVD SuperMulti Drive
- Intel GMA X3100 up to 384MB Graphics
- 15.4" WXGA 1280x800 Super Shine LCD Screen
- Web Camera, BT, Gigabit LAN, 802.11b/g Wi-Fi
- Windows Vista Home Premium
- Keyboard with Numeric Keypad
- 1 Year Limited On Site Warranty

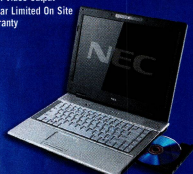


**\$1176** SAVE \$323 off RRP  
WebCode: NEC0025

## Refreshing Audio, Visual & Touch Experience

### NEC VERSA E6310

- Intel Core 2 Duo T7250 2.0GHz Processor
- 2GB DDR2 667MHz Memory
- 160GB SATA 5400rpm Hard Drive
- DVD SuperMulti Drive
- nVIDIA GeForce 8600M GS 256MB Graphics
- 14.1" WXGA 1280x800 Super Shine LCD Screen
- Webcam, Gigabit Lan, 802.11 b/g Wi-Fi, 56K Modem, BT
- Windows Vista Business
- HDMI Video Output
- 1 Year Limited On Site Warranty



**\$1236** SAVE \$583 off RRP  
WebCode: NEC0025

## High Performance Entertainment Machine

### NEC VERSA P8310

- Intel Core 2 Duo T5250 1.5GHz Processor
- 2GB DDR2 667MHz Memory
- 160GB SATA 5400rpm Hard Drive
- DVD SuperMulti Drive
- nVIDIA GeForce 8600M GT 256MB Graphics
- 15.4" WXGA 1280x800 Super Shine LCD Screen
- Webcam, Gigabit Lan, 802.11 a/b/g Wi-Fi, 56K Modem
- Windows Vista Home Premium
- Full Keyboard with Numeric Keypad
- 2 Year Limited On Site Warranty

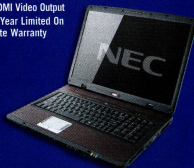


**\$1271** SAVE \$428 off RRP  
WebCode: NEC0028

## Experience Ultimate AV Home Entertainment

### NEC VERSA P9120

- Intel Core 2 Duo T7500 2.26GHz Processor
- 2GB DDR2 667MHz Memory
- 200GB SATA 5400rpm Hard Drive
- DVD SuperMulti Drive
- nVIDIA GeForce 8600 GS 512MB Graphics
- 17" WXGA 1440x900 Super Shine LCD Screen
- Webcam, Gigabit Lan, Wi-Fi a/g/n, Bluetooth
- Windows Vista Home Premium
- Integrated 4 Speakers & 1 Subwoofer, Hybrid TV Tuner (Analogue / Digital)
- HDMI Video Output
- 1 Year Limited On Site Warranty



**\$1722** SAVE \$577 off RRP  
WebCode: NEC0027

# NEC

### ASUS P750 Smartphone

Complete Business Solutions with high speed data transfers designed to cater to users who require a full-featured PDA phone that can deliver top-notch business as well as GPS functions Complete Connectivity and Business

#### Features

- Travel GPS shares
- Memorable journeys
- Never get lost with location courier
- Convenient user-friendly input
- Intuitive contact list
- Search



**\$912** | **SAVE \$87 off RRP**  
WebCode: ASP0028

### ASUS R600 Satellite Navigation

To cater to users who require a sleek, compact and powerful Personal Navigation Device (PND), ASUS has announced the release of ASUS R600 Auto Light Sensor PND. With an intuitive built-in auto light sensor that automatically adjusts the LCD backlight, Bluetooth hands-free, and the ability to transform into a portable multimedia entertainment centre.



**\$347** | **SAVE \$107 off RRP**  
WebCode: ASP0024

### ASUS VW193T 19"

#### Widescreen LCD Monitor

The VW193T LCD monitor can accommodate multiple Windows on screen to increase productivity • True Resolution: WXGA+ 1440x900 • Brightness (Max.): 300cd/m2 • Contrast Ratio (Max.): 1600:1 • Response Time: 5ms • Stereo Speaker (built-in): 1W x 2 stereo • PC Input: DVI-D & D-Sub

**BONUS  
ASUS  
Broadband  
Router \$69  
Value**



**\$327** | **SAVE \$72 off RRP**  
WebCode: ASM0027

## Discover the Exceptional

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Rock Solid · Heart Touching

### ASUS Ee PC Notebook Black

<b>Processor</b>	Intel Dothan 900MHz Processor
<b>Memory (Ram)</b>	512MB DDR2 Memory
<b>Hard Drive</b>	4GB Solid State Disk
<b>Display</b>	7" XGA Display
<b>Graphics</b>	Intel GMA 900
<b>Connectivity</b>	10/100 LAN, 802.11b/g
<b>Operating System</b>	Windows XP Home
<b>Webcam</b>	included
<b>Warranty</b>	1 Year Warranty
<b>Weight</b>	0.92kg

White (ASU0780) **\$562**



**\$562** | **SAVE \$37 off RRP**  
WebCode: ASU0781



### ASUS Pro 50VL Notebook

<b>Processor</b>	Intel Dual Core T5450 1.66GHz
<b>Memory (Ram)</b>	2GB DDR2 Memory
<b>Hard Drive</b>	200GB Hard Drive
<b>Optical Storage</b>	DVD SuperMulti Drive
<b>Video Card</b>	ATI MR X2300 128MB
<b>Graphics</b>	15.4" WXGA 1280x800 LCD
<b>Connectivity</b>	10/100 LAN, 802.11b/g Wi-Fi, BT
<b>Warranty</b>	2 Year Warranty
<b>Operating System</b>	Windows Vista Home Premium



**\$1182** | **SAVE \$117 off RRP**  
WebCode: ASU0945

### ASUS F3E Notebook

<b>Processor</b>	Intel Dual Core T7500 2.0GHz Processor
<b>Memory (Ram)</b>	2GB DDR2 Memory
<b>Hard Drive</b>	160GB SATA 5400rpm Hard Drive
<b>Optical Storage</b>	DVD SuperMulti Drive
<b>Video Card</b>	Intel GMA X3100
<b>Display</b>	15.4" WXGA 1280x800 LCD Screen
<b>Connectivity</b>	Gigabit LAN, 802.11b/g Wi-Fi, BT, included
<b>Webcam</b>	2 Year Warranty
<b>Warranty</b>	included
<b>Operating System</b>	Windows XP Pro

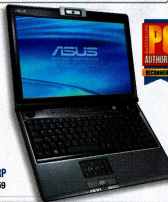


**\$1352** | **SAVE \$47 off RRP**  
WebCode: ASU0081

### ASUS M50 Notebook

<b>Processor</b>	Intel Dual Core T9300 2.5GHz Processor
<b>Memory (Ram)</b>	4GB DDR2 Memory
<b>Hard Drive</b>	320GB SATA Hard Drive
<b>Optical Storage</b>	BluRay Combo Drive
<b>Video Card</b>	ATI HD3650 1GB Graphics
<b>Display</b>	15.4" WSXGA+ 1680x1050 LCD Screen
<b>Connectivity</b>	Gigabit LAN, 802.11b/g Wi-Fi, Bluetooth, Firewire
<b>Operating System</b>	Windows Vista Ultimate
<b>Warranty</b>	2 Year Warranty

**\$2446** | **SAVE \$153 off RRP**  
WebCode: ASU0959





# HOT DEALS

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Great for schools

## Bean USB Flash Drive 8GB – Orange

This colourful and ergonomic design is a nice thing to look at, and a pleasant thing to have. It leaves boredom behind and invites interested glances. It's a friendly, convenient and cosy, designed especially for young people who like every-day objects closed in unusual soft shapes.

- 8GB Green (SIG0012) \$55
- 8GB Blue (SIG0013) \$55
- 4GB Orange (SIG0014) \$33
- 4GB Green (SIG0015) \$33
- 4GB Blue (SIG0016) \$33



**\$55** SAVE \$24 off RRP  
WebCode: SIG0011

Perfect for MSN Messenger & Skype

## Mini USB Notebook Webcam

Add a whole new level of communication to our online chatting sessions with the new Mini USB Notebook Webcam

- 2 megapixel lens
- Built in Microphone
- Take quick photos with the snap shot button

Perfect for Messenger Live or Skype



**\$34** SAVE \$35 off RRP  
WebCode: SIG0017

Integrated trackball

## Wireless Multifunction Cordless Presenter

Control PowerPoint presentations without being tied down to your computer on 50 feet away. Built in laser pointer USB plug & play 2.4GHz Wireless Built in Trackball & Soft Keyboard



**\$49** SAVE \$40 off RRP  
WebCode: SIG0009

## All in one USB 2.0 Card Reader

- True plug & play and hot swapping
- MicroSD/T-Flash direct access
- M2 direct access
- Support NEW high capacity standard SDHC SD card
- Support O/S: Win 98SE/ME /2000/XP/Vista, MAC OS 8.6 & above



**\$15** SAVE \$14 off RRP  
WebCode: SIG0008

Read cards from cameras

Unbeatable value

## Clip 2GB MP3 Player

Listen to your favourite music on the go with the Clip 2GB MP3 player

- Simple & trendy Clip design
- 128 x 32 OLED LCD display
- Built-in Lithium rechargeable battery
- Size: 5.5 x 2.3 x 1.6cm
- Includes Stereo Headphones



**\$39** SAVE \$30 off RRP  
WebCode: SIG0010

Neat & tidy, ready for business

## Tango USB Flash Drive 4GB

Pleasant, soft shape and vivid colours outlined by bold metal frame. Smooth feel. Classy, charming and slightly avant-garde.

- Features:
- Designed to utilise the high bandwidth of USB 2.0 interface
  - Capacity 4GB
  - No Driver Required, except on Windows 98SE
  - Bootable

8GB (SIG0006) \$52



**\$28** SAVE \$29 off RRP  
WebCode: SIG0001

Vertical stand included

## Tower 7 Port USB 2.0 Hub

- Supported data speed: 1.5/12/480 Mbps
- One upstream and seven downstream ports
- Supports both bus and self-powered
- Over-current detection and protection for each downstream port
- Hot-swappable Plug & Play connection
- Support O/S: Windows 98SE/ME/2000/XP/Vista, MAC OS 8.6 & above



**\$33** SAVE \$26 off RRP  
WebCode: SIG0007





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Total Value

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**2.6GHz**  
Core 2 Duo CPU

**3GB DDR2**  
Memory

**250GB**  
Hard Drive

**15.4"**  
Display

**1300 658 600**

**citysoftware.com.au**

Now with Service Pack 1

### Microsoft Windows Vista Home Premium SP1 Academic Upgrade

Windows Vista Home Premium is the preferred edition for home desktop and mobile PCs. It provides a breakthrough design that brings your world into sharper focus while delivering the productivity, entertainment, and security you need from your PC at home or on the go.

Full (MSA5118) **\$327**

Full Upgrade  
(MSA5119) **\$187**



**\$113**

SAVE \$26 off RRP  
WebCode: MSA5120

Perfect for 3 home PC's

### Microsoft Office Home & Student 2007 3 User

Office Home and Student 2007 is the software suite that helps people easily create great looking documents, worksheets and presentations, as well as manage notes and information at home.

Included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- OneNote 2007



**\$196**

SAVE \$33 off RRP  
WebCode: MSA6101

The best office academic suite

### Microsoft Office Professional 2007 Academic

Office Professional 2007 is a complete, easy-to-use suite of productivity and information management software to help business professionals save time and stay organised.

What's included in  
Office Pro 2007:

- Word
- Excel
- PowerPoint
- Access
- Publisher
- Outlook with Business Contact Manager.



**\$287**

SAVE \$12 off RRP  
WebCode: MSA6107

Treat your hand with style

### Microsoft Wireless Optical Mouse 2000

- Scroll Wheel to move through your documents quickly
- Get a grip with a comfortable design created for either hand
- Extended Battery Life
- Easy to Set Up and Use - Just plug in the receiver to get started



**\$38**

SAVE \$11 off RRP  
WebCode: MST8423

Great desktop combo

### Microsoft Wireless Optical Desktop 700 v2

Get the reliability you expect from Microsoft hardware at an extraordinary value - with the Microsoft Wireless Optical Desktop 700. This keyboard and optical mouse combine the freedom of wireless with the control of an optical mouse with scroll wheel. Plus, it's easy to use - just plug in the receiver and start typing.



**\$49**

SAVE \$10 off RRP  
WebCode: MST8249

Microphone built-in

### Microsoft LifeCam VX-6000

Communicate with friends and family as if they were in the room with you. See the smiles clearly with 640 x 480 pixel video resolution. High Definition video and photos show you in the best light. See the smiles clearly with up to 1.3MP Video Calling.



**\$94**

SAVE \$35 off RRP  
WebCode: MST8425

**Microsoft**

# Pioneer of Innovative Technology

## DreamBook Slim M66SR/M54

RRP (inc-GST) from  
**\$699**



	<b>Processor</b> Intel Core Duo / Core 2 Duo
	<b>Memory</b> Up to 4GB DDR2 667 / 800MHz
	<b>Display</b> 14.1/15.4" WXGA/WXGA TFT
	<b>Graphics</b> nVidia 8400 128MB / Integrated
	<b>Optional</b> Windows Vista Home Premium

## DreamBook Light IL1 (I'd love 1)

RRP (inc-GST) from  
**\$499**



	<b>Hardware</b> 1GHz CPU, 1GB DDR2 Memory
	<b>Storage</b> 40GB Hard Drive
	<b>Display</b> 7" Widescreen
	<b>Battery</b> 6-Cell, lasts up to 8 hours!
	<b>Optional</b> Windows Vista Home Premium

## DreamBook Light M72/R

RRP (inc-GST) from  
**\$1059**



	<b>Processor</b> Intel Core Duo / Core 2 Duo
	<b>Memory</b> Up to 4GB DDR2 667 / 800MHz
	<b>Display</b> 12.1" WXGA Widescreen
	<b>Graphics</b> Up to 256MB Integrated Graphics
	<b>Microsoft</b> Windows Vista Home Premium

## DreamBook UMPC 650

RRP (inc-GST) from  
**\$1199**



	<b>Processor</b> VIA 1.2GHz
	<b>Memory</b> 768MB DDR2 533MHz
	<b>Display</b> 6.5" Widescreen
	<b>Graphics</b> Up to 128MB Integrated
	<b>Microsoft</b> Windows Vista Business

## DreamBook Power 8227

RRP (inc-GST) from  
**\$1459**



	<b>Processor</b> Intel Celeron M / Core 2 Duo
	<b>Memory</b> Up to 4GB DDR2 667 / 800MHz
	<b>Display</b> 17" WXGA TFT Widescreen
	<b>Graphics</b> nVidia GeForce 6400 512MB
	<b>Microsoft</b> Windows Vista Home Premium

## DreamBook Power M57R Santa Rosa

RRP (inc-GST) from  
**\$2159**



	<b>Processor</b> Intel Core 2 Duo Santa Rosa
	<b>Memory</b> Up to 4GB DDR2 667 / 800MHz
	<b>Display</b> 17" WXGA TFT Widescreen
	<b>Graphics</b> nVidia 8700/8800GT 512MB
	<b>Microsoft</b> Windows Vista Home Premium

## DreamBook Power D90

RRP (inc-GST) from  
**\$3159**



	<b>Processor</b> Intel Core 2 Duo QX Series
	<b>Memory</b> Up to 4GB DDR2 667 / 800MHz
	<b>Display</b> 17" WXGA TFT Widescreen
	<b>Graphics</b> nVidia 8700/8800/8800GT 512MB SLI
	<b>Microsoft</b> Windows Vista Home Premium

## DreamBook Style 825

RRP (inc-GST) from  
**\$1159**



	<b>Processor</b> Intel Core 2 Duo Santa Rosa
	<b>Memory</b> Up to 4GB DDR2 667 / 800MHz
	<b>Display</b> 15.4" WXGA TFT Widescreen
	<b>Graphics</b> nVidia GeForce 6400 512MB
	<b>Microsoft</b> Windows Vista Home Premium

## DreamVision Vii Mini PC Pro

RRP (inc-GST) from  
**\$1059**



	<b>Processor</b> Intel Core 2 Duo Santa Rosa
	<b>Memory</b> Up to 4GB DDR2 667 / 800MHz
	<b>Display</b> Optional LCD Monitor / TV
	<b>Graphics</b> Intel GMA950 Up to 256MB
	<b>Microsoft</b> Windows Vista Home Premium

## DreamBook Tough V10

RRP (inc-GST) from  
**\$4759**



	<b>Processor</b> Intel Core 2 Duo
	<b>Memory</b> Up to 2GB DDR2 533 / 667MHz
	<b>Display</b> 10-12" WXGA Widescreen
	<b>Graphics</b> Up to 128MB Integrated
	<b>Microsoft</b> Windows Vista Home Premium

## DreamVision Power Core 4

RRP (inc-GST) from  
**\$909**



	<b>Processor</b> Pentium D / Core 2 Duo / Core 2 Duo
	<b>Memory</b> Up to 8GB DDR2 667 / 800MHz
	<b>Display</b> Optional Widescreen LCD
	<b>Graphics</b> Up to 2 nVidia GeForce 9600GT SLI
	<b>Microsoft</b> Windows Vista Home Premium

## DreamBook Tough V15

RRP (inc-GST) from  
**\$2659**



	<b>Processor</b> Intel Core 2 Duo
	<b>Memory</b> Up to 4GB DDR2 533 / 667MHz
	<b>Display</b> 15.4" WXGA Widescreen
	<b>Graphics</b> Intel Up to 256MB Integrated
	<b>Microsoft</b> Windows Vista Home Premium

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The Epson Stylus CX9300F has so many features that it puts other office equipment to shame. Not only does it print, scan, copy and fax, it uses Epson DURABrite™ Ultra ink cartridges for all your low-cost office printing needs. So whatever your business, there's a complete range of printers to satisfy your needs; making Epson the most versatile worker for your business. Visit [www.epson.com.au/office](http://www.epson.com.au/office) for more information.



#### Epson Stylus Photo RX690

- Print, scan and copy
- LCD viewer, PictBridge and card slots
- Direct print to CDs/DVDs
- Optional Auto-Duplexer



#### Epson Stylus CX8300

- Print, scan and copy
- LCD viewer, PictBridge and card slots
- Individual DURABrite Ultra ink cartridges – sharp black text



#### Epson Stylus C110

- Up to 37 pages per minute – super fast print speed
- Individual DURABrite Ultra ink cartridges – sharp black text